

AMERICAN GAS ASSOCIATION MONTHLY

May 1927

Volume IX

Number 5

A Trip Through the Testing Laboratory

By ONE WHO HAD TO BE SHOWN

The Laboratory's Record to Date

By R. M. CONNER

What the Women's Clubs' Survey Shows

The Sales Problem Is Fourfold

By T. J. STRICKLER

More Than Two Hundred Slogans Submitted

Progress in Exact Analysis of Flue Gas

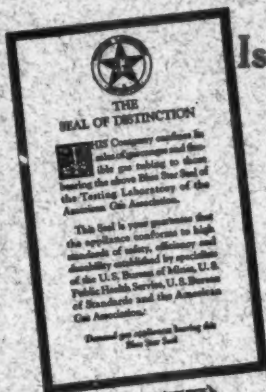
By F. E. VANDAVEER

Testing the Efficiency of Radiant Heaters

By G. B. SHAWN



The BLUE STAR Seal



(Your Name and Address)

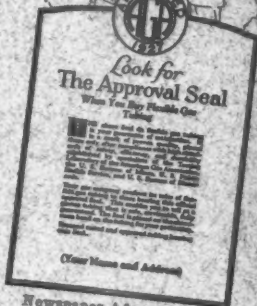
Newspaper Advertisement

Is Being Supported
By the Entire
Manufactured
Gas Industry



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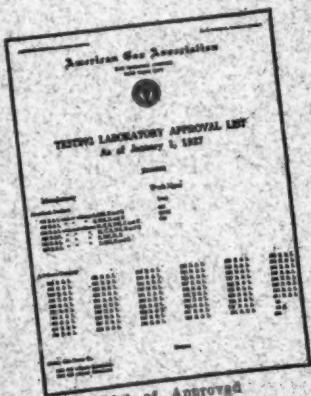
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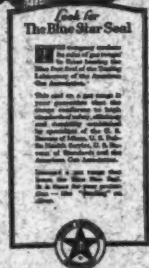
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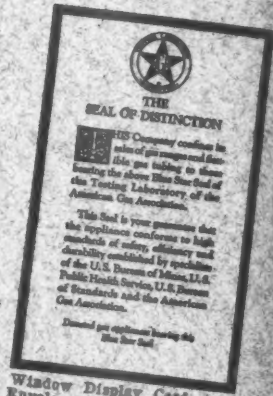


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(Your Name and Address)

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Window Display Card, and Envelope Stuffer

With 4471 approved gas ranges, 120 approved space heaters, and 15 types of approved tubing, the Blue Star Seal has taken on a new commercial significance. Are you one of the many companies capitalizing on this by confining your sales to approved appliances? The A. G. A. is supplying free of charge the material shown above.

Write Today—and Order What You Need

All material, except the list of approved appliances, can be secured from Association Headquarters. The Approval Lists can be secured from the Testing Laboratory, Foot of East 62nd St., Cleveland, Ohio.

AMERICAN GAS ASSOCIATION MONTHLY

420 LEXINGTON AVENUE, NEW YORK, N. Y.

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VOLUME IX

MAY, 1927

NUMBER 5

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SUBSCRIPTION RATE

\$3.00 PER YEAR

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Entered as Second Class Mail Matter at the Post Office at Brattleboro, Vermont,
February 10th, 1922, under the Act of March 3, 1879.

Our Own Who's Who



XXIV

Ord Preston

BORN August 15, 1874, at St. Helena, California. Educated at Phillips Academy and Yale University, from which latter institution he received the A. B. degree. Upon graduation he engaged in the banking and brokerage business in New York City, then spent two years in the coal industry at Pottsville, Pa., returning to New York as floor member of a stock exchange firm.

In 1918 received commission in the U. S. Army, Aviation Section; received discharge as Major in 1919. Has been a director of the Washington Gas Light Company since 1910; active in the management of the subsidiaries of the Company; elected to the vice-presidency in 1923 and to the Presidency in 1924.

He is very active in general charities work in the Capital; is a director in several prominent institutions. Has served as director of A. G. A.

AMERICAN GAS ASSOCIATION MONTHLY

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No. 5

A Trip Through the Testing Laboratory

BY ONE WHO HAD TO BE SHOWN

EVER since the gas industry began to talk in earnest about a central testing laboratory for appliances, I have been a charter member, so to speak, of the ballyhoo. Understand, I have nothing personally at stake one way or the other, in the laboratory and its findings. I am not a manufacturer of appliances. I became interested in the movement because I was convinced from the beginning that it would do bigger and better things for the industry than any single project ever inaugurated heretofore.

On the 31st of July, 1927, the labora-

tory will be two years old. In twenty months of that period, more than 4471 ranges, 120 space heaters and 15 kinds of flexible gas tubing have been tested and approved. This is real progress—far more than I expected. It goes to show what the gas industry can do when it gets squarely behind a thing with both shoulders.

It seems only a few days ago that I was at the last convention of the A. G. A. at Atlantic City and voted in favor of the most important resolution ever presented at an annual gathering of gas men—the one putting the industry on official record



The staff of the A. G. A. Testing Laboratory



Laboratory office and office staff

in favor of restricting the sale of appliances and tubing to those bearing the approval seal of the laboratory. When that resolution was adopted, I turned to a friend and said:

"That thing has dynamite in it. From now on you are going to see a new gas industry."

And that's what has happened, only some persons take a longer time to see it than others.

On my desk as I write this are various articles clipped from trade papers and newspapers telling the most recent laboratory news, A. G. A. pamphlets and folders, the latest lists of approved appliances, advertising material promoting the Blue Star Seal, and other miscellaneous literature. I have read every bit of it, and while it tells the story all right, it has the fault of the common garden varieties of literature—it doesn't get under your skin and make you want to stand up and cheer.

I'm constituted differently from the average individual, I guess. For example, I am one of those "must see it for himself" persons. I never purchased anything offered for sale in the mails. I never signed a coupon to an advertisement. But let me see the thing I am interested in and I will tell you in about two minutes whether or not I'll buy it.

Take Roxy and his gang! The first time I tuned in on them, I was only mildly interested. However, there was some-

thing intimate and friendly about the program that appealed to me. The next week I tuned in again and was more favorably impressed than ever. Only one thing was lacking—I wanted to see Roxy and look over his gang. The more I thought about it, the more I wanted to see him. Finally, I got the urge so strong that I visited the studio. It was one glorious night for me. Roxy and his gang were all that the music and conversation said they were, and today I can tune in on him and get a hundred per cent return on the investment.

The same thing has happened to me with the laboratory. The more I read and talked with others about it, the more I wanted to slip out to Cleveland and look it over. I discussed it with others in my organization, and they said since all my senses except eyesight were apparently defective, I might as well take the trip and get it out of my system. I did.

I arrived in Cleveland on one of those nice days when the rain pours in eighteen different ways. I took the street car, got off at East 62nd Street and waded in the direction of the East Ohio Gas Company's plant. Gas plants are always easy to locate, as every nose knows, and I had no trouble finding this one. The first building inside the gate, at the left, was the office of the A. G. A. laboratory. I walked into a room occupied by the office manager and some stenographers and was



New purifier house



G. B. Shawn, Laboratory Supervisor



R. M. Conner, Laboratory Director

then ushered into the laboratory director's office.

R. M. Conner, the director, met me. I am not writing this as a Who's Who Guide to the laboratory. From what I saw of the men there they need no puffs from me.

The working hours for the laboratory staff and office men and women are from eight in the morning to five in the evening. Conner starts in at 7 o'clock in the morning and if all goes well and not too many visitors like myself come around to bother him, he gets home sometimes in the cool of the evening.

I didn't waste any time telling him what I was there for. "If the thing's worth talking about, it's worth seeing," I said, "and I am out here to get my eyes full. Let's start."

We left the building in the direction of the laboratory. Cleveland was selected for the site, I was told, because it is centrally located, is a large appliance manufacturing center, and has three different kinds of base gases available for testing and research work. As we walked along, I was shown the water gas plant of the East Ohio Gas Company which supplies any type of producer, blue water, carbureted water, or, in fact, any gas of this nature varying in heating value from 300 to 600 B.t.u. that the laboratory might desire to use in its testing work. This is

a highly important factor in testing work, as any engineer will tell you, but you have to see the equipment with your eyes to have it sink in your mind.

In addition to the various gases mentioned above, I was told that the gas mains adjacent to the laboratory supply coke-oven gas which is quite similar in its characteristics to oil gas supplied along the Pacific Coast. These mains also supply natural gas, which comes from the gas fields of West Virginia and Ohio, and is the same kind of gas piped by the natural gas companies throughout Ohio, Pennsylvania, West Virginia, and certain parts of southern California. The minute I heard all this, I realized how wise the A. G. A. officials were in choosing Cleveland as a testing center.

THE LABORATORY'S HOLDERS

At this point I was shown the 150,000 cu.ft. holder which has been used by the laboratory from the beginning. It now holds one of the test gases being used in the laboratory work. Further on is the 800,000 cu.ft. holder which will store one of the base gases as soon as the research work on mixed gases is under way, and on my right was the new 5000 cu.ft. holder in which the various gases are mixed that are used in research work. Some men were working on the holder and new piping—equipment to be used in



What happens when a range is tested: Top, left, fire hazard test; right, making construction tests. Center, left, sampling products of combustion from top burners; right, another view of the fire hazard test. Bottom: biscuit baking test, one of the 160 separate and distinct tests made on a range.

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mixed gas research. I remarked that the most recent A. G. A. literature I had said that a comprehensive program of research was contemplated for the near future. I soon discovered that the equipment for this research was ready right now for use, which shows the value of seeing things for yourself.

WHERE THE TESTING IS DONE

Directly ahead of us was the laboratory building. I didn't expect to see a skyscraper or a marble Parthenon, so I wasn't disappointed. It was a two-story brick building of sturdy proportions, with the top floor occupied by the laboratory testing staff. We stopped on the ground floor to look at the two 1000 cu.ft. holders which are connected up to the 150,000 cu.ft. relief holder in such a manner that the laboratory can use three different kinds of gases at one time, or mix them in any proportion desired. This is another one of those "little things" that you are apt to hear about and not appreciate until you have seen it. Leading from the holders I noticed the valve control, manifold and the three different colored pipes which indicate the three different kinds of gases available. The piping to appliances used in the research work is an entirely separate line.

At the top of the stairs we came to the office of the laboratory supervisor, G. B. Shawn, who can hold up his head with the best of them. His experience includes more than five years as assistant physicist in the gas section, U. S. Bureau of Standards. We got to talking about the other men, and it developed that each one is a college graduate, and that most of them have unusual war records. One testing engineer was in the German navy for four years and was part-time chief engineer and commander of a submarine.

Another, of Irish blood, served five years in the Canadian regular army with the famous Princess Patricia infantry.

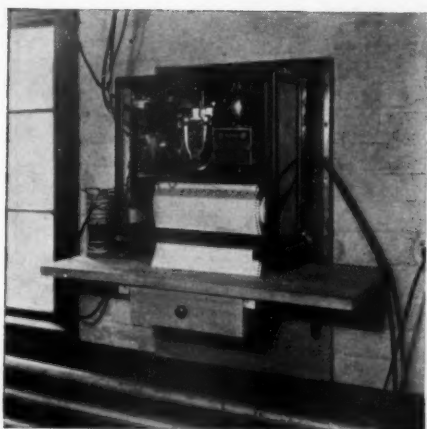


New holder erected by the laboratory for use in mixed gas research

He participated in every one of the major offensives, including Mesopotamia and Salonika, and came through with four wounds. Later on in the day, after I had met the entire staff, I was convinced that they were the best material to be had in the country for this kind of work. They would do credit to any gas company, I know that.

Conner left me here and Shawn took me in tow. The first large room we entered was the range-testing section. The two principal points of interest here are recording CO apparatus developed by the U. S. Bureau of Mines, and the iodine pentoxide apparatus, perfected and built for the laboratory by the U. S. Bureau of Standards. Both types of equipment are used for the accurate determination of carbon monoxide. The recording CO machine has a sensitivity of approximately two parts in a million and is accurate, they tell me, to about two parts of 100,000. The iodine pentoxide apparatus is also accurate to about two parts in 100,000.

I am not strong on technical detail, but when Shawn told me one of those ma-



Four-point recording pyrometer

chines would register the CO in the smoke belched by locomotives which pass near the laboratory, that was enough to convince me they were good. Furthermore, I was told that an approved space heater—one that successfully passes the laboratory test, you know—doesn't generate any more CO than three men smoking cigars in an average room.

For those of higher engineering learning who may read this, here is the description I got of the two machines mentioned above:

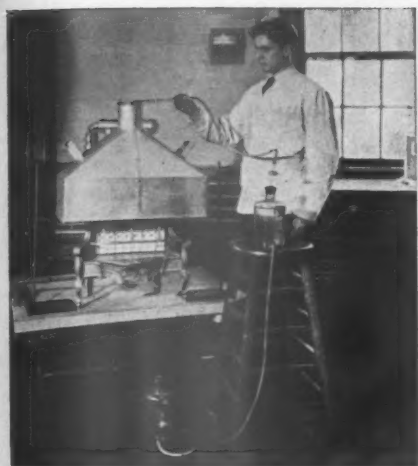
The recording CO apparatus depends for its operation on the reaction of carbon monoxide with a preparation known as hopcalite, which is a mixture of manganese dioxide and copper oxide. The sample of products is drawn from the appliance through a $\frac{1}{2}$ " pipe and condenser to take out some of the moisture, and forced through the machine by a motor-driven pump located below. They are further dried by passing them through two bottles of sulphuric acid, a bottle of glass wool to take out acid spray, soda lime tower to further take out acid gases, absorbent charcoal to take out certain hydrocarbon gases, and a calcium chloride tower to further dry the gas. The products of combustion then pass through a fixed orifice which allows a measured

amount of gas to pass through coils in the steam bath where it is heated to 212° F., and on into the hopcalite chamber, also at 212° F.

At this temperature the only gas present which reacts with the hopcalite is carbon monoxide. The carbon monoxide reacts with the hopcalite to produce heat, which is measured in terms of electromotive force by the recording potentiometer. These readings are calibrated directly in percentages of CO, the original calibrations being made with an iodine pentoxide apparatus.

The iodine pentoxide apparatus is strictly a chemical method of determining the presence of carbon monoxide. The sample is collected in sample bottles of known capacity and passed through the various towers located on the machine's frame. These towers, with exception of the iodine pentoxide tower, accomplish about the same purpose as the drying agents used on the CO recorder. In the order that they are met, reading from left to right, you see a heated chromic acid tower, chromic acid tower at room temperature, and a V shaped container filled with potassium hydroxide and phosphorus pentoxide. When the sample enters the iodine pentoxide tower, the carbon monoxide reacts with the iodine pentoxide, maintained at 302° F. to liberate free iodine, which is collected by a solution of potassium iodide in the small Gomberg bulb.

After it has been allowed to run for approximately a half hour, depending upon the amount of CO in the sample, the Gomberg bulb is emptied into a flask and a small amount of starch added to give it more color. This solution is then titrated or brought back to a clear color by adding a measured amount of sodium thiosulphate solution, which is contained in the two graduated burrettes. The amount of CO can be readily determined by substituting in a prepared formula the amount of thiosulphate solution of c.c. required to titrate the sample.



Top, left, space heater ready for test in 1000 cu.ft. air tight room; right, fire hazard test on space heater. Center, left, sampling products of combustion from a space heater; right, Burrell gas analysis apparatus. Bottom, left, thermal conductivity apparatus for determining ratio of air to gas in air-gas mixtures; right, testing gas-fired hot air furnace.



View of range testing department

At this point I was surprised to hear that, on a regular type of gas range equipped with a thermostat, about 160 separate and distinct tests are made. The method of testing ranges simulates the conveyor system. Around the wall are various meters and gas connections called "stations." There are in all ten of these, which means that when operating at full capacity, ten ranges are under test at one time.

Operations performed at each one of the different stations are so scheduled that they will all be completed about the same time, so that the ranges, resting on castors, travel right around the room and out of the same door that they come in after all tests have been completed. The 160 different tests logically divide themselves into what is known as adjustment, fire hazard, thermostat, baking characteristics, carbon monoxide, leakage, and construction tests. The construction tests are made last because the range is very often torn entirely apart in order that the metals can be gauged and all of the different dimensions accurately determined. If the testing work done in this one room could be interpreted to the American housewife in terms that she could understand, the approved gas range would be appreciated as representing the best that money can buy.

The next room we entered was the central house heating appliance testing section. This room is equipped with various stations and the main points of interest

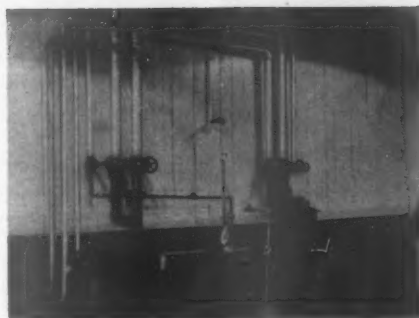
are the four-point temperature recorder, thermal conductivity apparatus for determining air gas ratios, and the Thomas meter equipment used for accurately measuring amounts of heated air in the gas furnace tests. I saw actual tests being made and can vouch for their thoroughness.

Next in line was the water heater section where all types of gas-fired water heaters will be examined for approval. This room is equipped with large-sized gas mains, water drains, recording temperature thermometers and pyrometers. The blower and piping is used in conducting tests on the effectiveness of the various types of down draft diverters. By the time this appears in print, actual testing work on water heaters will be under way.

We next came to the chemical testing laboratory where the research on mixed gases is now being carried on and where all accurate types of gas analysis work, other than that for the purpose of determining CO, are performed. The most important equipment here is the Haldane gas analysis apparatus, Burrell apparatus and the apparatus for determining specific gravity. I particularly noticed a large glass-enclosed hood which is used for conducting tests to determine the corrosive resisting qualities of oven-lining and burner-grid materials. Such gases as sulphur trioxide and hydrogen sulphide



View of space heater tests



Three more interesting views at the Testing Laboratory at Cleveland, Ohio. At the top are shown a test of a gas-fired boiler and a test of a hot air furnace. The center picture shows a partial view

of the water heater test room. Already more than 4471 gas ranges, 15 types of tubing and 120 space heaters have been tested. Work on testing other appliances is well under way.

are used during these tests. It was here that I met Vandaveer, the laboratory's chief chemist, who has received his Ph.D. degree in industrial chemistry from the University of Illinois.

From the standpoint of equipment, the space heater testing department next visited is probably the most interesting of all the different sections. I was immediately attracted to the Wahlen gauge which is used for determining very small differential pressures created by the stack gases of space heating appliances. Such determinations are necessary in computing the cubic feet of products of combustion that pass up the flue of the appliance and the amounts that pass off into the surrounding room. The radiant efficiency apparatus was developed by the laboratory, another one of these things you don't hear about until you see it for yourself.

The very delicate thermopile used in connection with this apparatus was de-

signed by Professor Coblenz, of the U. S. Bureau of Standards, and is similar in general respects to the type which he uses for measuring temperatures on the planet Mars. This thermopile is connected to a sensitive galvanometer and is rotated around and over the surface of an imaginary hemisphere. The readings secured are averaged, taking into consideration the area of the different sectors, and from these data the amount of heat radiated is determined.

The apparatus is calibrated against a standard electric lamp, from which the rate of heat emission is known in terms of B.t.u. per sq.ft. per hour at a given distance. The laboratory uses to a limited extent the thermal conductivity CO and CO₂ apparatus designed and built for it by the U. S. Bureau of Standards. This apparatus depends for its accuracy and operation upon the thermal conductivity of the measured gas. It is accurate



The Edward's density balance for determining the specific gravity of gases

to about four parts in 10,000 and its advantage over the iodine pentoxide and CO recording apparatus is that determinations for both CO and CO₂ can be made in much less time than on any of the other machines. They also use this same principle for determining air-gas ratios.

No one can go this far in the laboratory without appreciating the close cooperation existing between the staff, laboratory, and specifications committees, the U. S. Public Health Service, U. S. Bureaus of Standards and Mines, and the Master Plumbers Association. One visit is sufficient to convince you of the truly national scope of the laboratory's program and the active participation therein by all interested bodies.

The next thing to attract my attention was the air-tight test room of 100 cu.ft. content. It is connected to a blower and meter in such manner that the air can be changed any required number of times from zero to ten times per hour. When air is circulated through the room, the cold air is drawn in at the top and taken out at the bottom. A large cone diffuses the

air entering the top of the room and the hot air is drawn out around the base through a duct that is so graduated in size and opening that the pull is uniform all around the base of this container.

This room is used to determine the effect of a reduction in oxygen on the operation of space heaters. All space heaters are subject not only to tests of this kind but also to tests for CO under normal operating conditions. Many of the fatal asphyxiation cases that we learn of in service are caused by the customer burning an inferior type of space heater in a small room with the windows and doors closed. Nothing unusual in the operation of the appliance can be noted at first but as a reduction of oxygen takes place the heater, if it is incorrectly designed, produces CO at a very rapid rate, dependent upon the reduction of oxygen.

A rather careful study of a large number of such asphyxiations indicates that the oxygen content in rooms in each instance seldom drops below 19 per cent. Laboratory space heater tests require that 20,000 B.t.u.'s of gas be consumed which reduces the oxygen content of this closed room to approximately 18 per cent, or one per cent less than it would probably ever be called on to meet in service. Even under these conditions an approved space heater must not produce a dangerous

(Continued on page 272)



View of a gas-fired boiler test

The Laboratory's Record to Date

In Less Than Two Years, It Has Given Splendid Service To the Entire Industry

By R. M. CONNER
Director, Testing Laboratory



R. M. Conner

ONE might logically ask at this time, roughly a year and a half after the Testing Laboratory's establishment, just what have been its accomplishments. What has the gas industry to show for its investment of approximately \$125,000? In the beginning let me state that without doubt the most valuable contributions it has made will never be brought strikingly to anyone's attention. They are such features as the added conveniences and comforts that will result from the use of safer, more efficient, and standardized types of gas appliances, all of which can be analyzed accurately only in terms of the customers' goodwill.

Goodwill is a rather intangible asset, somewhat difficult to define and yet absolutely essential in insuring the complete success of any public utility business. I believe it is needless to add that the future of an industry such as ours rests principally upon a foundation of goodwill. Better gas appliances will mean more satisfied customers, and, in the end, should result in greater popularity for the use of gas.

The Testing Laboratory was established on June 1, 1925. Activities of the first few months were confined entirely to remodeling work and the installation of necessary testing equipment. Coincident with this work committees were appointed for the preparation of approval requirements for space heaters, water heaters, house heating appliances, installation of appliances, and the revision of existing gas range specifications.

The requirements for flexible gas tubing being completed, tests were begun on this class of equipment August 1, 1925. At the same time research work necessary in the preparation of safety requirements for gas ranges was taken up by our Laboratory and the United States Bureau of Standards. By January 1, 1926, most of the testing work on flexible gas tubing had been completed, the requirements for gas ranges adopted and testing work begun on them. On June 1, 1926, approval tests had been started on space heaters, and by April 1, 1927, water heater testing was begun. Fully one-fourth of the efforts of the testing staff have been confined from the beginning to research work required in the preparation of safety requirements for ranges, space heaters, water heaters, and house heating appliances. At the present date standards of acceptance for these four major types of household equipment have been approved and laboratory tests are being conducted on the three mentioned above.

The April 1 list of approved appliances includes 15 types of gas tubing, 96 space heaters and 4638 gas ranges. Prior to October 1 we hope also to supply a fairly complete list of approved water heaters and house heating appliances.

MANY RANGES APPROVED

The recent large increase in the number of models of approved gas ranges has naturally attracted considerable attention. There has been no relaxation of the high standards for efficiency and safety set by the Laboratory with its coordinating agencies.

Manufacturers generally have many models differing in finish and in minor construction details from those which have secured Laboratory approval. Upon request, inspectors from the Laboratory



Laboratory approval is the theme of this window display of the Consolidated Gas Co. of New York

Section, aided by J. W. West, Jr., secretary of the Commercial Section, prepared the first national advertising material featuring the Blue Star Seal of Approval and the desirability of approved appliances. This material consisted of the following: four newspaper advertisements, window display card, mailing card, and list of laboratory approved tubing and appliances.

Of all this material, that having the greatest possibilities is the small mailing card which is a replica of the large window display card, to be mailed out with the customers' gas bills. These cards will fall into the hands of the housewives and should prove interesting and educational to them. It is the writer's opinion that the first two logical steps in advertising the American Gas Association's Laboratory are: (1) Thoroughly selling the gas industry itself on the plan, (2) Placing our story before the public. Once the people are educated to demand approved appliances, it will not take the dealers and department stores very long to realize the necessity of stocking them. Unless there is some specific demand, however, on the part of the customer, some dealers will probably continue to offer the cheaper types of appliances, on which they can generally make the greatest profit. With a growing demand on the

part of his customers, however, for approved types, it is only reasonable to assume that within a very short time the average dealer will fall in line.

At the present time the Publicity and Advertising Section is working on additional advertising material featuring the Laboratory Seal of Approval, all of which is for the ultimate object of bringing about a general public acceptance of this symbol of merit. To prove that this can be done one has only to point to the very high regard with which the average housewife holds the seals of the *Good Housekeeping* Institute and *Modern Priscilla*.

Another activity that should assist in featuring the sale of quality products is the bound copy of approved ranges, space heaters and tubing recently published by the Testing Laboratory. Every company member has been furnished one of these free, and placed on our mailing list which entitles them to subsequent editions. Anyone can secure a copy of this booklet on payment of a \$2.00 fee which represents the actual cost of printing the booklets and maintaining the monthly mailing service.

The Testing Laboratory was established as a public necessity. Being fundamentally right in principle it is sure to succeed. Its prompt acceptance by such a large number of our manufacturers and the

financial and moral support given it by gas companies has surpassed even our most optimistic anticipations. I am sure that very few realize the total cost of conducting our appliance testing program to date. Considering laboratory expenditures, test and inspection fees, and the cost to the manufacturers of making such changes as were necessary, I believe that one might very conservatively estimate this figure at half a million dollars.

It is generally comparatively easy for an industry to recognize the necessity of such an altruistic plan as that underlying the establishment of the Laboratory even in one with so many different views as are represented in ours. However, to convince its people that they should spend large sums of money to place such a plan in full effect is an entirely different matter. The fact that the gas business has done so—and liberally—is an indication of its sincerity and earnest desire to serve its customers to the best of its ability. The principles on which the Laboratory is founded and its establishment are positive proof of the fact that the gas industry proposes to place the safety and general welfare of its customers above its own convenience or that of any immediate profits.

A Trip Through the Laboratory

(Continued from page 268)

amount of CO, which is an additional factor toward securing safe and flexible gas appliances. Needless to say, here is one test that you have got to see to appreciate.

We turned back here and when passing the chemical testing section, I saw a middle-aged man helping one of the laboratory men take a range apart. My curiosity was aroused. The middle-aged man, I was told, was the manufacturer of the range in question and had already spent three days at the laboratory putting it through various tests under the guidance of the laboratory staff. Of course, no manufacturer is permitted to observe tests on any appliances other than his own.

Here was a good opportunity, I

thought, to learn what a manufacturer would have to say. After we were introduced I asked him why he had come to the laboratory. He pointed to the range and said: "To bring this range and all other models we manufacture up to A. G. A. specifications so that we can get them approved and tell the world about them."

He admitted that it was going to cost his company a tidy sum to turn out approved goods. "I don't give a hang about the cost," he stated. "I want the market and I want to hold the market. The only way to do that is to play ball with the laboratory. I only wish I had been here three months ago."

That was just the kind of talk I wanted to hear. Further on, I was introduced to a manufacturer from California. I thought he was there to see the laboratory, as I was, but I was mistaken.

"I made the trip to see how the boys were getting on with my furnace," he explained. "The manufacturers on the Coast are all behind this movement."

There were other manufacturers in attendance that day, one or two gas men like myself, with two committee delegations scheduled for the coming week.

Leaving the laboratory building, I ran into Conner and again inspected the new holder equipment and purifiers. Directly beyond them are several acres of flat ground which caught my eye.

"I don't know who owns that land," I said, "but I will wager you that before another five years roll around you will see a big new building over there housing laboratory equipment and a staff three times as big as you have now. Furthermore, the way this thing is catching on now, you will find the laboratory becoming a sort of Mecca for the men and women of our industry. Check me up in five years and see if I'm not right."

"We've very nearly reached the Mecca stage now," Conner replied. "But it's the finest kind of advertising for the laboratory. It's the kind that lasts, you know."

And it certainly is, or I would never have written this manuscript.

Testing the Efficiency of Radiant Heaters

Method of Operation Now Being Used by the Testing Laboratory of the American Gas Association

By G. B. SHAWN

Supervisor, Testing Laboratory



G. B. Shawn

radiator; by radiation, the method by which heat is carried from the sun to the earth. The following discussion will be devoted chiefly to this form of heat and its measurement.

Any object which is hotter than its surroundings gives off radiant heat. Radiant heat travels in straight lines and is not deflected from this straight line travel by air currents. Thus, the sun is able to send its heat rays through the moving layers of air around the earth, without deflection or absorption, until these rays strike the earth's surface.

Now we have for consideration a gas appliance whose action in some ways may be compared to that of the sun—the radiant type of room heater. Until a few years ago, room heaters were all designed to heat the room atmosphere by transferring the heat from their surface, or from a flame, to a current of air passing by them. The amount of heat radiated from such heaters directly to the surroundings is very small. The radiant heater, however, with its hot glowing surface will project a relatively large amount of heat directly through the room. The action of this type of heater may be easily understood if we carry out our analogy between it and the sun. Just as the sun can send its radiant heat

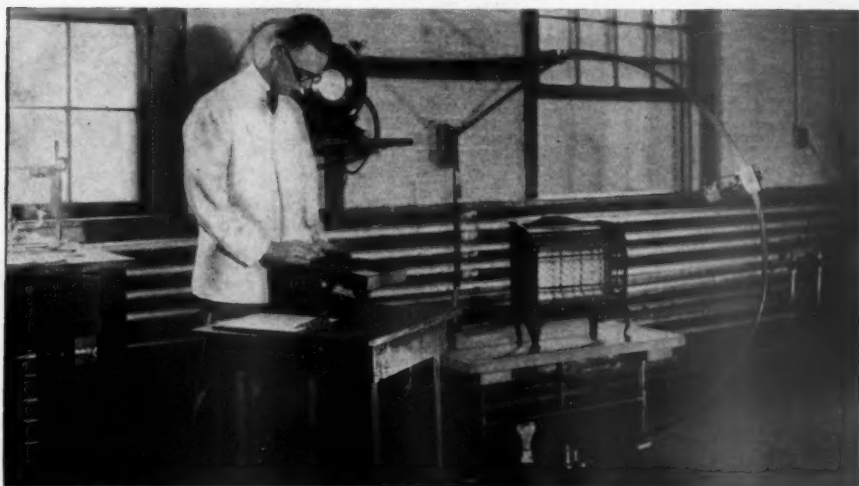
H EAT may be transferred from one point to another in three ways: By conduction, as it is carried through the iron section wall into the water in a steam boiler; by convection, as air is heated by circulation past the surface of a steam

through space to warm the earth, without heating up the atmosphere, so does the radiant heater project its heat through the room until it strikes some solid object. Thus, any person in the room may be warmed by the heater while the temperature of the room atmosphere itself is at an uncomfortably low value. The objects in the room when once heated will transmit heat to the atmosphere and gradually warm all of its space. The radiant heater, then, is designed to provide comfort while the room is being heated.

In its tests of radiant heaters, the Testing Laboratory is concerned with radiant efficiency—that is, the determination of the proportion of heat originally contained in the gas which is sent into the room as radiant heat. To do this it is, of course, necessary to determine the amount of heat radiated.

MEASURING RADIANT HEAT

The measurement of radiant heat from a heated body is always attended by difficulties caused by the influence of other forces on the measuring instruments. This is particularly true with the radiant heater for a large amount of heat is transmitted to the air by convection, and this in turn causes a circulation of heated air through the space surrounding the heater. Since we desire a measurement of the radiant heat only, it is necessary to eliminate the effects of the air currents on the instrument selected for measurement. One method consists of noting the temperature rise of a weighed amount of water placed in a copper box which is situated at a distance of about three feet from the heater. The box is insulated on all sides except that facing the heater, this side being blackened to increase the absorption effect. This method is open to



Determining the radiant efficiency of a space heater with apparatus developed by the Laboratory. The thermopile, at right, was designed by Prof. Coblentz of the U. S. Bureau of Standards, and is similar in general respects to the type which he uses for measuring temperatures on the planet Mars

two objections: First, the heat absorbed may be affected by air currents passing over the rough blackened surface of the box; second, the time required for measurement of temperature rise of suitable magnitude is too long—about one hour. The intensity of radiation through the space in front of the heater varies widely at different points, so that a great many measurements must be made. The instruments selected, therefore, should be capable of making measurements in a very short period. The instrument finally adopted by the Laboratory is called a thermopile. The type selected was developed by W. W. Coblentz of the Bureau of Standards. An elementary form of the thermopile is the thermocouple, which consists of two dissimilar wires joined at their ends. If the two junctions are exposed to different temperatures, a current will flow through the wires, the magnitude of the current being dependent upon the temperature difference of the two junctions.

The thermopile, as used in these tests, is made up of twelve thermocouples connected in series in order to obtain a rela-

tively large effect for any temperature difference between the two series of junctions. The couples are enclosed in a cylindrical brass box painted white to prevent absorption of heat over its surface. In order to allow radiant heat to strike one set of junctions, they are placed behind a narrow slit, the slit being recessed behind the face of the box to prevent air currents from passing over its transparent cover; the other series of junctions is protected from heat by the covering. Thus, we have one series of junctions heated up by the radiant heat, while the other junctions remain cool. Since the hot junction temperature depends upon the radiant heat passing through the slit, the temperature difference and, consequently, the current flowing through the thermopile, is proportional to the intensity of radiant heat at the slit. By placing a potentiometer in the circuit the effect of the radiant heat on the thermopile can be measured. The calibration of the instrument is effected by placing it at a point where radiant heat of known intensity falls upon the slit, and taking the potentiometer reading. For this work the

Laboratory obtained lamps from the laboratory of the National Electric Light Association, which has been carefully standardized for this purpose.

In calibrating the instrument, phenomenon known as diathermancy must be taken into account. Substances which transmit light are said to be transparent and, similarly, those which permit radiant heat to pass through them are said to be diathermanous. All solid objects, however transparent, absorb some of the radiant heat which falls upon them. It will be remembered that the radiant heat to be measured passes through a transparent quartz disc, so that we are faced with the necessity of determining the amount of radiant heat absorbed by this disc. The diathermancy of a substance usually depends upon the nature and temperature of the source of radiant heat. Since the temperature of the radiating elements varies with different heaters, the best substance to use for covering the slit would be one, if it could be found, whose diathermancy was unaffected by this temperature variation. Among all the substances tried, a polished disc of clear rock salt was the only one showing the desired characteristic. However, exposure to the intense heat radiated caused the disc to lose its polish and a change in reading would occur. Consequently, it was decided to make a diathermancy correction for each heater using a quartz disc as the slit covering. The method used is outlined as follows: A number of readings are taken at fixed points directly in front of the heater to be tested with the slit uncovered, and in a vertical plane. The construction of the slit is such that when it is in a vertical plane, the thermopile will be unaffected by convection currents. These readings are compared with those taken at the same points with the quartz disc in place. The comparison gives a correction factor to be applied to all readings taken in the course of a test.

In use the thermopile is mounted on a carriage which slides on a bar formed in the arc of a circle of two feet radius. This

bar is mounted in a vertical position on pivots at top and bottom so that it may be swung along the arc of a horizontal circle. The heater to be tested is placed at the center of the arc, lighted and allowed to burn for about one-half hour to insure complete warming up. Measurements of the intensity of radiant heat are taken along the arc at intervals of ten degrees between the limits of sixty degrees each way from the central position. The readings are repeated for each horizontal movement of the bar which is also made each ten degrees over limits of sixty degrees from the center. The illustration shows the method of setting up the heater for test as well as the manner of setting the thermopile at the desired points. From the curvature of the bar, it is at once apparent that all the precautions taken to eliminate the effect of convection currents, particularly above the heater, are necessary.

RAPIDITY OF INSTRUMENT

We now have the intensity of the radiated heat at 169 different points. The area covered by the readings includes all the useful heat radiated from the appliance. The amount of heat radiated is found by multiplying the average intensity found by the area covered by the readings. The intensity figures are given in terms of heat units per hour, and the total radiated heat is therefore found in the same terms. By means of a gas meter and calorimeter the heat in the gas supplied is found in the above terms and efficiency calculated by determining the ratio of the two figures. An interesting point is the rapidity with which readings can be taken. The instrument adjusts itself to the varying conditions so quickly that all the readings can be taken in the space of three hours.

The accuracy of the method used above depends primarily upon the potentiometer readings. The readings taken vary all the way from zero to about 2.75 millivolts, the average over the whole area

(Continued on page 318)

EDITORIAL

By *ALEXANDER FORWARD*

Managing Director

Accomplishment

THE Association is to be congratulated upon what has been accomplished. The work which has been done and that for which a way has been opened is the most important and promising development of many years."

It is easy for us to modestly admit the truth of the above statement made by Dr. Geo. K. Burgess, Director of the Bureau of Standards, discussing our Testing Laboratory in Cleveland in his address at our last Annual Convention. We hardly need further justification for the space and prominence given to the Laboratory in this issue of the MONTHLY.

The Laboratory has, in the brief period of its active operation, attained full recognition as a national institution, founded and maintained by the manufactured and natural gas industries to serve the American people. It stands for the maintenance and development of nationally recognized standards of efficiency and safety in the use of gas burning domestic appliances.

Gas companies generally have demonstrated their unqualified support of this purpose, first, by contributing their own funds to equip the Laboratory and to finance the research work necessary to the development of national standards, and, second, by confining their own sales

LEST WE FORGET

WHEREAS the Association recognizes that our duty to the public we serve, as well as our own interest, demands undivided and wholehearted support of our Appliance Testing Laboratory and its program which has the full cooperation of the United States Bureaus of Standards and Mines and the Public Health Service, be it

RESOLVED first, that it is the sense of the American Gas Association in convention assembled that no gas ranges or flexible gas tubing which do not bear the Laboratory seal of approval will be sold or offered for sale by any member gas company;

RESOLVED second, that since in the judgment of this Association it is essential that to make available to the American public at the earliest possible date a full quota of tested and approved appliances, every member gas company is requested to notify manufacturers of ranges and tubing of their adherence to the policy stated in these resolutions;

RESOLVED third, that it is detrimental to the best interests of the public and the gas industry that appliances or tubing not qualifying for American Gas Association standards be made or marketed, and we deplore and disapprove any such practice; and

RESOLVED fourth, that the Executive Board be requested to consider the adoption of a policy which will make the purpose of these resolutions effective both as to gas companies and manufacturers.

of appliances to those bearing the Laboratory's seal of approval. In this stand the gas companies are supported by an increasing number of dealers, including some of the largest department stores and mail order houses.

It must never be forgotten that for the most part the manufacturers of appliances have loyally and enthusiastically supported the industry's goal of the highest standards of efficiency and safety. They have made extensive and in some cases costly

changes in order to meet the requirements and most of them do not make or sell any appliance which does not conform to the standards.

We have already ample approval lists of gas ranges, space heaters and gas tubing, and within a few weeks approval lists of water heaters and within a few months approval lists of central house heating appliances will be available.

The support and cooperation given our work by the United States Bureau of Standards, the Bureau of Mines, the Public Health Service and the Master Plumbers Association are further sources of strength to our program.

All branches of the industry will benefit by perfecting the efficient and safe use of gas. Unanimous support and recognition of the Laboratory is inevitable.

Progress In Exact Analysis of Flue Gas

Four Different Kinds of Apparatus Are Now Being Used for This Important Work

By F. E. VANDAVEER, Ph.D.
Chief Chemist, Testing Laboratory



F. E. Vandaveer

THE greatest progress in the exact analysis of flue gas has been made in the last ten years by developing apparatus for determining carbon monoxide in quantities as low as 0.001 to 0.002 of one per cent or one to two parts per 100,000. This equipment is so sensitive that it shows the presence of carbon monoxide in the air of industrial districts, residence sections, and streets of the business sections of large cities. Tobacco smoke has such high concentrations of this gas that these instruments would not be able to indicate the total percentage before reaching the upper limit of their calibration. The usual types of apparatus such as the Orsat, modified Orsat, Burrell, or Haldane would not even detect the percentages that are regarded as large amounts for such instruments.

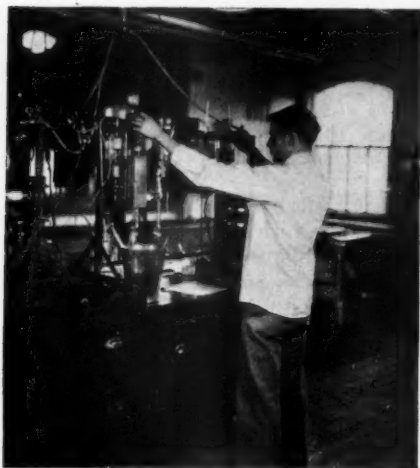
Credit for developing the carbon monoxide recorder is due the Bureau of Mines and the Mine Safety Appliances Company. The Bureau of Standards perfected the iodine pentoxide and the thermal conductivity apparatus. Minor modifications and adaptations of these instruments to large volume routine testing of gas appliances have been made by the Testing Laboratory. They are the only types of apparatus on the market at present that are suitable for determining the completeness of combustion of gas under the methods outlined in the present A. G. A. approval requirements for gas appliances. The decision of the Gas Range Committee of which C. C. Winterstein, U. G. I. Contracting Company, Philadel-

phia, is chairman; the Space Heater Committee of which E. J. Stephany, Equitable Gas Company, Pittsburgh, is chairman, and the Sub-committee on Water Heater Approval Requirements, headed by G. C. Carnahan, The Peoples Gas Light & Coke Co., Chicago, to set a standard of practically no carbon monoxide with the maximum allowable under any condition of test of 0.01 of one per cent concentration in a 1000 cu.ft. room, and in most cases 0.02 of one per cent carbon monoxide air-free in the products of combustion marks the beginning of a new era in the exact analysis of flue gas from gas appliances.

When a requirement such as the one above is placed on an air-free basis, the results obtained by analysis are multiplied by an air-free factor. This factor depending upon the excess air in the sample may vary from approximately two to ten; consequently, if the maximum allowable amount of carbon monoxide is 0.02 of one per cent air-free and the factor is ten, the maximum allowable concentration in the sample would be 0.002 of one per cent. A concentration of 0.003 of one per cent would give 0.03 of one per cent air-free and the appliance being tested would not be approved. In other words, the analytical apparatus must be accurate to at least 0.002 of one per cent or two parts in 100,000.

IODINE PENTOXIDE APPARATUS

The iodine pentoxide method is probably the basic one for determining carbon monoxide because it does not depend on other apparatus for calibration. It is reliable and accurate to about 0.002 of one per cent. Facilities for standardization of solutions and a chemist are required. The time for one determination varies



Iodine pentoxide apparatus for determining completeness of combustion, perfected and built by the U. S. Bureau of Standards

from 20 minutes to two hours, depending on the concentration of carbon monoxide in the sample, a high concentration necessitating a longer time. An experienced man can run two machines making approximately 30-40 determinations a day providing the concentration in each sample is not greater than 0.02 of one per cent.

Determining carbon monoxide by means of iodine pentoxide is not a new method, the reaction being described by Ditte in 1870. Since that time many investigators have made use of this reaction. It was not until a short time after the World War, however, that a compact apparatus, such as shown in the illustration, was perfected by the Bureau of Standards. This method depends on the selective oxidation of carbon monoxide by iodine pentoxide at approximately 302 degrees F., and is explained by the following reaction:



The iodine liberated is sublimed and collected in a 10 per cent potassium iodide solution. The amount of iodine collected from a measured volume of the products

of combustion is titrated with 0.001 N sodium thiosulfate using potato starch as the indicator. From the amount of sodium thiosulfate used the percentage of carbon monoxide in the sample can be computed.

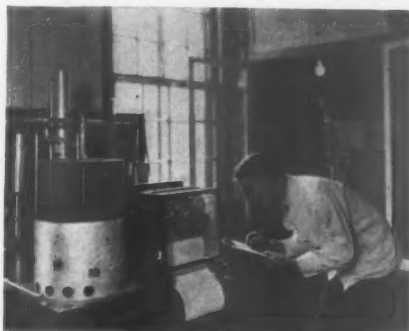
The operation of this apparatus is explained as follows: Before the sample reaches the iodine pentoxide, it must pass through a purifying system to remove such gases as might react with iodine pentoxide. It passes successively through a chromic acid tower to remove aldehydes and unsaturated hydrocarbons; another chromic acid tower to further remove aldehydes and unsaturated hydrocarbons and some moisture; then into a V-shaped tube where a small amount of solid potassium hydroxide is placed at the entrance to remove acid gases such as sulfur dioxide, sulfur trioxide and some carbon dioxide; the remainder of the tube is filled with phosphorus pentoxide to completely dry the sample which next enters the iodine pentoxide U-tube. This tube is immersed in an oil bath at 302 degrees F., and maintained at this temperature by an electrically controlled thermostat. After the sample has been taken into the apparatus the whole system must be purged out with a gas free from carbon monoxide. This insures that all the sample is passed through the iodine pentoxide and that all the liberated iodine is purged out of the U-tube. Air, free from this oxide of carbon or nitrogen, may be used for purging. It was found necessary in our Testing Laboratory to use nitrogen for the reason that pure air cannot always be obtained. This is caused by the fact that most industrial districts have furnaces, switch engines, coal-fired boilers, etc., which incompletely burn a large share of the fuel supplied them. Nitrogen is used as a purging agent and is taken into the apparatus directly from compressed nitrogen cylinders through a sulfuric acid bottle and a trap to prevent excess pressure. In the hands of a skilled operator this apparatus is an accurate and dependable method of determining the

presence of carbon monoxide in very small percentages.

THERMAL CONDUCTIVITY APPARATUS FOR CARBON DIOXIDE AND CARBON MONOXIDE

Although the thermal conductivity method for gas analysis has been investigated by various laboratories for a number of years, its most satisfactory application shown in the photograph was only recently developed by the Bureau of Standards. As the name implies, the analysis of the gas is determined by the rate at which heat is carried by the gas under standard conditions. The standard method of evaluating thermal conductivity is by measurement of the heat carried over a fixed area between two points in the conducting medium, with the temperature at these points fixed. In this instrument, however, only one temperature is fixed and the other temperature is determined by the thermal conductivity of the gas. This second temperature is the determining point in the analysis.

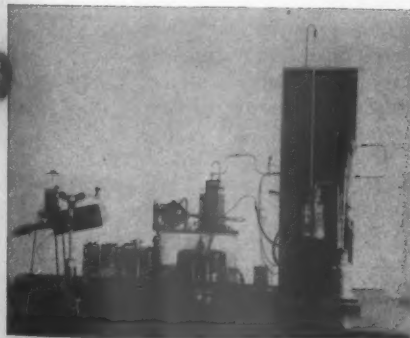
The essential parts in the analysis apparatus are two cells and a graduated slide wire. Each cell has a fine platinum wire stretched along its axis, along which current flows at a constant voltage. If the cell is filled with gas and is kept at a constant temperature, heat (as a result of the current) will be conducted from the wire by the gas to the cell wall until the tem-



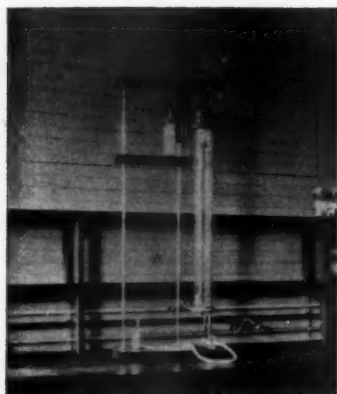
Recording carbon monoxide apparatus developed by the U. S. Bureau of Mines

perature of the wire reaches a point where the rate at which heat is carried is equal to the rate of heat liberation by the current. The equilibrium temperature is fixed by the conductivity and in turn by the composition of the gas. If a cell held at constant temperature is sealed with some gas such as air, and current is passed at a constant voltage, the temperature of the platinum wire and consequently its resistance is fixed. By arranging the second cell so the sample to be analyzed can be introduced and comparing the resistance of its wire against that of the sealed cell, we have a means of fixing the conductivity and hence the analysis of the sample. This is carried out in analysis of carbon dioxide plus air mixtures as follows: The wires of the two cells are joined as two adjacent arms of a Wheatstone bridge, the slide wire forming the other two arms. The bridge is balanced by means of a galvanometer. As the carbon dioxide content of the sample varies, the resistance ratio between the cells likewise varies and the adjustment of the slide wire changes. Calibration is made from the slide wire readings for known mixtures.

For the determination of carbon monoxide the arrangement is varied as follows: Both cells are arranged for the introduction of the sample, and a combustion furnace is placed between the cells. The procedure consists of passing the gas



Thermal conductivity apparatus for carbon dioxide and carbon monoxide



Carbon dioxide apparatus

in order through a cell, the combustion furnace, and the second cell, stopping the gas flow when the system is full of sample. The sample for analysis consists of air, nitrogen, carbon dioxide and possibly carbon monoxide. If the last gas is present, it is burned on passing through the combustion furnace to carbon dioxide and the analysis of the mixture in the two cells is different. The conductivity of the mixture is lower in cell No. 2 than that in No. 1 since carbon dioxide has a lower conductivity than carbon monoxide. The bridge is balanced and the reading noted. Next, the order of gas flow is reversed and the system again filled with sample. Cell No. 1 now has the lower conductivity gas and No. 2 the higher, just the reverse of the former case. As a result of the interchange, the bridge is unbalanced and must be adjusted to a new reading on the slide wire. The difference between this and the first reading is the indication of the amount of carbon monoxide. This indication is translated into percentage by calibration against chemical apparatus such as the iodine pentoxide.

Since both carbon dioxide and carbon monoxide can be determined in the one instrument, it is very convenient and rapid. The determination of carbon dioxide is as accurate as the apparatus

against which it is calibrated. The readings may be obtained as low as 0.01 of one per cent. On account of the type of combustion furnace the readings observed are really those for products of incomplete combustion which include carbon monoxide, hydrogen and aldehydes. However, this is a desirable feature in view of the fact that appliances should be designed to burn the gas completely. Further, it can be said that if hydrogen and aldehydes are present, carbon monoxide is also present and the reading is an indication of that gas.

CARBON MONOXIDE RECORDER

The carbon monoxide recorder was developed by the Bureau of Mines and the Mine Safety Appliances Company shortly after the World War. It was first used to measure carbon monoxide in parts per million from automobile exhaust gas in the Liberty Tunnels at Pittsburgh. For routine testing of gas appliances it is convenient and reliable provided it is used in the right way. It should never be used in any case where a slight increase in the draft above the appliance will aid the appliance. In such a case the true operation of the appliance would not be obtained. It is possible to make 30 to 40 determinations a day with one recorder. Its sensitivity is one part per million and it is safe to say that it is accurate to one part per 100,000. The recorder is calibrated against an apparatus capable of measuring carbon monoxide in small percentages such as the iodine pentoxide or a precision dilution apparatus. If the recorder is handled correctly, calibration will be necessary only two or three times a year.

A measured amount of gas is passed through a catalyst called hopcalite (an intimate mixture of copper oxide and manganese dioxide) maintained at 212 degrees F., by a steam bath, the carbon monoxide being selectively oxidized by the hopcalite. The reaction liberates heat which is transmitted to a thermopile imbedded in the hopcalite. The e.m.f. gen-

(Continued on page 314)

What the Women's Clubs Survey Shows

Commercial Section Committee Finds Pertinent Information in Results of Nationwide Survey of Women's Clubs

THE Commercial Section Committee on Interpretation of Commercial Statistics has received a mass of information and statistics entitled "Results of Urban Home Equipment Survey," for study and analysis. This survey was conducted during 1925 and 1926 by the General Federation of Women's Clubs under the direction of the Industrial Survey and Research Service, Washington, D. C. Nationwide in its scope, the survey embodies information in regard to nearly 8,000,000 homes in 2228 communities, located in 48 states and the District of Columbia. Collectively, the families reached by the survey represent some 32,000,000 people, or approximately one-half the estimated population of incorporated villages, towns, and cities in 1925.

Believing that the results of this survey could be summarized and presented in such a way as to be of interest to the gas industry, the Committee on Interpretation of Commercial Statistics, Davis M. Debard, Chairman, has undertaken a thorough analysis of the survey data, and presents here a summary of the more significant facts based upon it. Further analysis along regional lines is now being made by the committee, and a more comprehensive summary will be submitted at the annual convention in Chicago next October. It is the hope of the committee

that this will enable the individual gas companies to compare their local conditions and development with the national or regional averages in other communities of about the same population.

The general survey embraces 2228 communities divided into eight population groups, ranging from towns under 1000 to cities of 100,000 and over. About 740 communities, or one-third of those surveyed, report gas service, but of this number about 170 fall within population groups of less than 5000 and furnish information so meager as to be practically useless.

There remain, therefore, for practical consideration some 570 communities (6,400,000 families) reporting significant information in regard to the use of gas and of gas appliances. For purposes of comparison, the committee has tabulated figures, obtained from the survey, in regard to the use of other utility services, household appliances, and facilities for recreation.

Table 1 shows the proportion of families having gas service in their homes, compared with electricity, water, telephones, automobiles, radios, phonographs, and pianos. The overall figures indicate that, out of every 100 families, 84 have running water, 80 have electricity, and 75 use gas. It is significant that as the size of the community increases, the percent-

Table 1—GAS SERVICE IN URBAN HOMES COMPARED WITH ELECTRICITY, TELEPHONE, WATER, RADIO, AUTOMOBILE, PHONOGRAPHS, PIANOS
Ratio of families having service or device to total number of families, expressed as a per cent

Type of Service or Device	Population Classes of Communities					
	5,000 to 10,000	10,000 to 25,000	25,000 to 50,000	50,000 to 100,000	100,000 and over	Total of all classes
Gas service.....	54.6	57.8	63.4	70.8	84.2	75.4
Electric service.....	79.3	78.6	78.4	77.	81.5	80.
Water service.....	72.3	79.1	81.5	79.9	93.7	83.9
Telephone service.....	52.8	56.1	54.6	54.1	57.7	56.5
Automobiles.....	58.7	57.4	59.8	57.4	54.	55.7
Radio sets.....	18.7	24.9	25.9	26.6	26.1	24.1
Phonographs.....	34.6	42.5	45.4	43.2	60.3	46.2
Pianos.....	37.4	37.7	43.1	36.8	43.6	40.4

Table 2—GAS AND ELECTRIC APPLIANCES IN URBAN HOMES
Ratio of families having device to total number of families, expressed as a percentage

Type of Appliance	Population Classes of Communities					Total of all classes
	5,000 to 10,000	10,000 to 25,000	25,000 to 50,000	50,000 to 100,000	100,000 and over	
Gas lighting.....	3.4	6.7	11.3	6.5	10.	9.7
Gas ranges.....	47.9	50.9	60.2	69.	79.2	70.5
Gas water heaters.....	19.4	21.9	25.6	33.7	50.	37.3
Electric lighting.....	79.3	78.6	78.4	77.	81.5	80.
" washing machines.....	21.4	20.9	23.4	23.4	23.5	23.
" irons.....	58.9	61.2	60.2	54.7	67.8	63.6
" ironers.....	1.3	1.3	1.4	1.7	2.7	1.9
" range.....	3.6	2.5	1.9	1.2	1.7	2.1
" vacuum cleaner.....	28.7	29.8	30.4	34.5	37.6	34.6
" refrigerator.....	.7	.9	1.	.8	2.	1.3

age of families having gas rises until it exceeds the figure for electricity in cities of 100,000 and over. It indicates the desirability of running high pressure pipe lines to groups of small towns or to connect them with large centers of population. Telephone service and automobiles are reported in slightly more than half of the homes surveyed, and phonographs, pianos, and radio sets in less than half.

Table 2 shows an interesting comparison of the use of gas and electric appliances by families living in communities of 5000 population and over. As was to be expected, the figures show that the use of gas for lighting is relatively limited even in the largest cities. The use of gas for cooking, however, is encouragingly large, the proportion of families having ranges varying from about 50 per cent in the smaller towns to nearly 80 per cent in cities of 100,000 and over. Of all the household appliances listed in the table, the gas range is easily the leader. The gas water heater, while far behind the range, is found in more homes than any electric appliance except the flatiron. The vacuum cleaner comes next among electric appliances, and the washer third. The percentage of families using electric irons, ranges, and refrigerators is still very small. Perhaps the most significant point for the gas companies is the indication that the number of water heaters can be doubled in many places with adequate sales effort, supported by competitive prices for gas.

The committee believes that the figures

presented in these tables, although admittedly subject to the deficiencies inherent in all *average* data, nevertheless offer a fair indication of the present relative use of equipment in the American home.

C. M. Cohn Calls Attention to Scholarship Opportunity

CHARLES M. COHN, vice-president of the Consolidated Gas Electric Light and Power Company of Baltimore, Md., has sent the following letter to approximately 800 gas companies to call attention to the opportunity of offering scholarships in the Department of Gas Engineering at the Johns Hopkins University. With the letter an interesting reprint from the *American Gas Journal*, titled "Third Year of the Gas Engineering Department at the Johns Hopkins University," was included.

Mr. Cohn's letter is as follows:

"One of the outstanding needs of the Gas Industry is trained, technical men to handle the engineering problems of the business in its various branches. The recently established Department of Gas Engineering at The Johns Hopkins University is now preparing such men and will, in my opinion, make valuable contributions in the future to the entire industry.

"For your information, I am taking the liberty of sending you a reprint of a recently published article describing the gas engineering courses and giving information concerning the men who are now pursuing them.

"You will note that as a means of improving public relations and at the same time providing students to attend these courses, a number of individuals and gas companies have offered, in their respective cities, one or more scholarships.

"Would your Company be interested in doing likewise for the coming scholastic year?

"Consideration and action are necessary in the near future so that suitable candidates may be selected in time, and I would therefore greatly appreciate your looking into this matter at your earliest convenience."

Mirroring the Future of Gas

Responsible House Directs the Attention of Bankers and Investors to Favorable Status of Industry

ONE of the significant developments in the field of domestic fuels is the changing attitude of both the public and the gas companies toward the use of manufactured gas for house heating.

The rapid increase in oil heating in the anthracite burning districts has had an important bearing on the present status of gas heating. The manufacturers of domestic oil burners have demonstrated that there is a substantial market for heating equipment that will relieve the house-holder of manual labor either by himself or others in the operation of

his heating plant, and at the same time automatically maintain his home at a uniform temperature. These manufacturers have learned that their sounder sales argument lies, not in trying to compare their operating costs with coal burning, but rather in showing the prospective customer that a superior heating service is available which will return him dividends on his investment in comfort and convenience.

In the acceptance by the public of these



ARTICLES such as this are of real value in that they point out to us some of the larger opportunities which are lying ahead of our industry. They are actually a mirror into which we can look and determine with accuracy the significance of certain trends and indications. Facts are revealed that might be overlooked by the average individual working in the gas industry because of his close contact with the business.

This article, which has been abstracted from the Industrial Bulletin, of Arthur D. Little, Inc., of Cambridge, Mass., points out the real future of gas house heating. The Industrial Bulletin places before bankers and investors pertinent information on the present status and probable trend of industrial development. The original article went into considerable detail describing the various advantages of gas as a fuel for heating homes.—Editor.

new standards of performance and value, the more progressive gas companies have seen an opportunity to extend their own service. It was natural that this movement should start in those sections having shorter heating seasons, in which the total cost of fuel is relatively less important.

Gas heating offers the simplest and most reliable of the present systems of automatic heating, at a cost which is comparable to that of the motor car, both as to initial investment and operating and maintenance expense. Like the automobile, its broad field is in the homes of those of

reasonable means—the gas companies in their market survey list as prospective customers house-holders with incomes of \$5,000 and over.

Looking toward future costs, we find both oil and anthracite involved in a situation of diminishing supplies and corresponding price changes. With higher prices for gasoline, the oil refiners will find it profitable to crack these furnace oils in increasing quantities and thus still further reduce the supply available for

Total of all classes

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23.
63.6
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2.1
34.6
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domestic heating. Except for changes in general commodity and labor costs, and the minor effect of the price of oil now used for gas enrichment, there are no factors in sight which are likely to seriously increase the cost of gas.

Another factor having an important bearing on the future cost of gas heating is the increasing attention being given to house insulation, with materials to cut down the loss of heat through the walls and roof.

The effect of this new load on the business of the gas companies, should be favorable. In a general way this service constitutes an addition to the daily peak load, which, together with its seasonable nature, will not improve the load factor. This condition has been taken care of in the construction of the rates either by a demand charge or a sliding scale, which is intended to return to the gas company the carrying charges on the capital investment incident to the new service.

It is of interest to note that the amount which the gas company must spend in this way for each new customer is variously estimated at from \$1,500 to \$2,000. This indicates an ultimate new investment of three to four million dollars in plant and

distribution facilities for the company serving a community of 500,000 people. These figures are based on the average household of five individuals, and the assumption that the two per cent of our families which are rated as having annual incomes of over \$5,000 are potential customers for gas heating.

The gas companies have not been forced into this business and have taken on this service only after they have been satisfied of a substantial return on the money invested in additional plant and distribution system. The companies selling manufactured gas for this service have also had the benefit of the long experience of the natural gas companies in determining service and maintenance charges for this class of equipment.

The seasonal nature of this heating load has a partial offset in refrigeration by gas, another domestic service which has already been undertaken by a number of the more progressive gas companies. The past year has seen important developments in equipment for this purpose, which will bring this service into more active competition with electric refrigeration.

Domestic refrigeration for food alone will provide a load for only a small por-

(Continued on page 306)



Interesting car cards that are being used resultfully by W. B. Edwards, Colonial Gas Assoc., Melbourne, Australia

Production Conference Program Announced

Interested Gas Men Are Urged to Make Plans to Attend
First Meeting of Its Kind Ever Held

By R. G. PORTER

Chairman, Joint Committee on Production Conference

ON the last day of May and the first day of June there will be held at the Book-Cadillac Hotel, Detroit, Michigan, the first annual Production Conference sponsored by the Carbonization and Water Gas Committees of the American Gas Association.

The following program, which has just been released by the Program Committee, speaks for itself. In the two days' sessions there will be considered and discussed subjects of the utmost importance to all gas production engineers. The summary presentations noted on the program will be based on data and experience that has been gathered from engineers in all parts of the country and covering all types and combination of types of gas-producing equipment. Two of the papers are based on work done at the Bureau of Mines in connection with research on coal and coke. Two of the items will represent progress reports of problems assigned to the production division by the Committee which is making an economic and engineering survey of the gas industry.

OPEN FORUM

On Friday afternoon an opportunity will be given for the consideration of special production problems which may not have been covered in the papers and summaries listed on the program.

At the Distribution Conference recently held in Baltimore more than 250 gas distribution engineers were present from all parts of the country. Fully as representative an attendance of production engineers is anticipated in Detroit. Everyone interested is urged to make plans to attend and to write for hotel reservations promptly, using the reservation slip attached to the program.

PROGRAM

BOOK-CADILLAC HOTEL, DETROIT,
MICHIGAN—May 31-June 1

Tuesday, May 31, 10:00 a.m.

Clinker Formation in Water Gas Generators

- (a) Summary Presentation, E. J. Murphy.
- (b) Relation of Fusibility of Ash in Coal and Coke to Formation of Clinker, P. Nicholls (U. S. Bureau of Mines).

Coal Gas Production

- (a) Summary Presentation, A. W. Warner.
- (b) *Progress Report on Present Production Methods, L. J. Willien.

Tuesday, 2:00 p.m.

Gas Oil

- (a) Summary Presentation, Philip E. Eddy.
- (b) Evaluation of Gas Oil, H. Vittinghoff.

Inerts

- (a) Summary Presentation, S. B. Sherman.
- (b) *Progress Report—Research in Utilization of Mixed Gases, F. C. Weber.

Liquid Purification

Geo. E. Wagner.

Wednesday, June 1, 10:00 a.m.

Soft Coal Operation

W. J. Murdock.

Coke

- (a) Summary Presentation, A. M. Beebee.
- (b) The Burning Properties of High and Low Temperature Coke, P. Nicholls (U. S. Bureau of Mines).

Wednesday, 2:00 p.m.

Open Forum

It is planned to devote this session to the discussion of items on the Production Questionnaire not listed for presentation at preceding sessions. So far as time permits these will include: Tar Emulsions, Steam Accumulators, Waterless Gas Holders, Production Records, New Devices in Water Gas Manufacture, etc. All members are invited to bring up at this session any problem of their own not covered in the program.

All time quoted in this program is *Day-light Saving Time*, which is one hour later than *Standard Time* as used on all train schedules.

*Items on program with asterisk represent progress reports on problems assigned by the Committee on Economic and Engineering Survey of the Gas Industry.

HOTEL RATES—BOOK-CADILLAC HOTEL

	<i>Per Day</i>
Single Room with Bath	\$3.50—\$4.00—\$5.00 6.00—7.00—8.00
Double Room with Bath	6.00—7.00—8.00 9.00—10.00

Cabinet Range Invented by Mrs. A. S. Miller

Modern Style of Range Originated in Kitchen of
Miller House Twenty-three Years Ago

INQUIRY at random has revealed the fact that not many people within the gas industry, much less outside, knew that it was a woman who had designed one of the most convenient kitchen appliances ever invented—the cabinet gas range. That this woman is Virginia Miller, the wife of Col. Alten S. Miller, vice-president of The Bartlett Hayward Company, and the inventor of a famous yarn which distribution departments use, makes this information of interest to the entire industry.

Mrs. Miller is essentially a home maker.

She gives the same thought and attention to the management of her household that her husband gives to his profession. The equipment in her home is modern and labor saving. It was probably her kindly thought for her help that was responsible for the idea eventually to mean so much to thousands of other home makers. One day, twenty-three years ago, Mrs. Miller was supervising the preparation of dinner. As she observed, her cook literally floored before the oven, it occurred to her that baking would not be nearly so hard on the cook if the oven were *beside* the top burners of the stove instead of below.

She invited her husband into the kitchen that evening and following her directions Col. Miller placed the top of the range on an old kitchen table and lifted the oven from its lowly position to one of equal rank beside the top burners, just as it is shown in the accompanying picture. The Miller household was delighted with the new arrangement. So were friends of the family who immediately wanted a range like it. Col. Miller, who was then vice-president and general manager of the gas company in Baltimore, asked Harry Hunter, later president of the Oriole Company and at that time associated with the Estate Stove Company, to make up a



The first cabinet range

dozen ranges, using Mrs. Miller's stove as a model. These were the first ranges of this type to be manufactured.

No profit for this invention has ever accrued to Mrs. Miller, for the idea was not patented but was offered freely to the manufacturers of gas ranges. The nicety of enamel finish and the convenience of heat regulators have been added, but the model originated in Mrs. Miller's kitchen so many years ago continues to be one of the most popular in use today.

Dayton Chapter of

A. S. S. T. Formed

A NEW chapter of the American Society for Steel Treaters has been formed at Dayton, Ohio. The Organization Committee was under the chairmanship of H. H. Skinner, in charge of gas sales, Dayton Power and Light Company.

F. M. Reiter, industrial engineer of the Dayton Power and Light Company, has been elected secretary-treasurer of the chapter, and Mr. Skinner has been elected to the executive committee.

More Than Two Hundred Slogans Submitted

List of Suggested Battle-Crys That Have Been Sent In After Official Request for Assistance

HE who started the present slogan controversy started something.

Regardless of the attitude toward "You can do it better with gas," almost everyone in the industry has his own personal idea as to what constitutes a good slogan. Those suggested range from commands to pleas, from verse to worse. Some of the contestants are apparently sceptical about the efficiency of slogans; others will die for them.

The response to the official plea for new slogans was more than gratifying. In the list that follows, every effort has been made to collect all those submitted, but there is no means of knowing whether or not all have been included.

A committee will be appointed to judge the selections.

The list is one that would do credit to any industry. There are many good suggestions, and the letters that accompanied the entries contained many salient and pertinent thoughts about the slogan matter.

One of the most thoughtful letters sent to the Editor concerned the future of the slogan after it had been selected. This man, who prefers to remain anonymous, forcibly brought out the need for suitable advertising of any slogan.

The suggestions of our members are given below. Appropriately the list starts with the one that has given good service for several years. It is one that still has many friends.

If it's done with heat, you can do it better with gas

Gas is yours to command

You can't beat gas heat

It's done better with gas

Yours truly—gas

If you only knew all gas can do

Gas knows no no

Do it better with gas

Better do it with gas

Can't beat gas heat

Gas heat can't be beat

How d'ye do without gas?

Gas is your obedient servant

Use gas as fuel—not fuel as gas

Why don't you use gas?

Gas is up to you

Use gas for complete heat

Heat it hotter with gas

Heat 'er up with gas

G-a-s—but it's hot

Gas is the short cut to heat

Get gas and you get heat

The glow of gas heats the mass

Gas is just rarin' to glow

Gas is yours to command

Gas at command of the hand

Where there's gas there's heat

Heat it with gas, of course

No muss or fuss with gas heat

Gas heats heat hotter

A few feet of gas for the big feat of heat

Heat it the better way—with gas

Heat with gas

Heat by pipe line

Gas heat serves you best

Heat the best way—with gas

Heat it with gas

Gas heat is the best heat

When heat is needed—the gas way is the best way

There is only one best fuel and it's gas

Why be a stoker? Use gas

Why use dirty fuels when gas is so cheap and clean?

Heat best with gas

If it's heat, that means gas

For heat, gas is your fuel

Heat only with gas

The logical means for heating—Gas

You get heat with gas

Heat it with gas

Comfort—Health—Convenience—with Gas

Gas Assures Satisfaction

Gas will heat the world

Gas—Man's best heat creation

Gas—Fuel bin of the millions

Gas heat speeds the world's products

Gas heat is best

Heat with gas—the fuel unsurpassed

Solve your heat problems with gas

Gas solves your heating problems

Gas serves best for heating

Gas for heat

Gas heat is a real treat

Gas—the perfect fuel

Gas—all fuel

Gas for heat—nuf said

All heat—that's gas

Gas is hot stuff

Gas heating—watch it grow

For goodness sake use gas for heating

Gas will do it better

Here to stay—gas for heating

You will use gas eventually

Your best fuel bin is the gas holder

It will pay you to use gas

You will be glad you heat with gas

Large Demand for Gas — tends to lower the price

GAS is the only fuel that has a tendency to decrease in price as the demand for it increases. The curve in the cost of all crude fuels has been sharply upwards during the last few years, and from all indications will continue to rise. But with gas it is the other way. Scientifically constructed furnaces now make gas available for many industrial purposes where formerly, for economic reasons, it was not used. The American Gas Association has appropriated half a million dollars for the purpose of applying a scientific laboratory test on gas burning furnaces, and designing and developing new ones to fit specific needs.

Industrial organizations should keep informed of the developments in gas furnaces used in their lines of business. All the information available will be gladly furnished on request to

American Gas Association
342 Madison Avenue, New York City

Send today for our interesting book,
"Gas—the Ideal Factory Fuel"

You can do
it Better
with GAS



You can do it better with gas—effectively used
in the June industrial advertising

Heat required—gas desired
Heat desired—gas required
Gas—it heats
You will succeed with gas
You can heat it best with gas
Success with gas
Gas heat brings results
Think of heat and you will think of gas
Gas for heat can't be beat
Try to improve on gas for heat
You can't best gas for heat
No fuel better than gas
Gas, today's perfect fuel
Certainly, we heat with gas
Of course gas is superior for heating
Indeed gas is our universal fuel
We enjoy gas heating
Gas for superior heating
Gas is the final fuel
Let gas do it
Let George do it—with gas
You must heat with gas
Heat with gas—you get results
Heat naturally
Heat means gas
Heat? Use gas
Gas is the final fuel
Gas—the final fuel for home and factory
Gas—the ultimate fuel for home and factory
Gas—it's the spirit of heat
Heat with gas—it saves
Gas must do the heating

Gas must do our heating
Gas for our heat
Our heat—by gas
Gas insures heat results
Comfort and cheap—gas for heat
Do it with gas heat
Gas will do your heating
Let gas do your heating
Want heat? Use gas. No ashes
Use gas for fuel
Use gas the ideal fuel
Gas, today's perfect fuel
Gas does it best
Gas, the universal fuel
Gas—Your best, quickest and cleanest fuel
Gas—the ultimate fuel
Gas Heat—Not better than the best, but
better than the rest
From smoke to sunshine
Greatest American Servant
The Nation's Hired Hand
Yours for the asking
Gas
Gas—the soul of coal
Do it right with gas
If it is heat—demand gas
Gas will banish muss and fuss
Heat assurance means gas
Demand gas for heat
Where heat is required, gas is the 100%
dependable fuel
Get the thrifty gas habit—it saves
Gas-Heat and Savings
Gas, y-our thrift fuel
Gas heat is sure fuel
your
Do it with gas, the heat with class
No shovel but a snow shovel in every home
Gas—your ultimate fuel
Gas, the fuel of the future
Gas for heat is hard to beat
Controlled heat for home and factory
Gas—the faultless fuel
Care-free heat
Gasisheat
Gasiservice
Gascandoit
Good As Sunshine
Gas heat, easiest, cheapest, cleanest, best
Use gas for heat, It can't be beat
Use gas the best fuel
For heating problems use gas and solve them
Gas does it all ways. Heat, light, power—use
gas
Gas heat—serves you right
Gas heat—always serves you right
It's gas for heat—that serves you right
Heat the best way—with gas
When heat is needed—the gas way is the
best way
Gas heat is the best heat
Heat it quickly, cleanly and economically
with gas
Gas heat serves you best
It's done better with gas
Heat it the better way with gas
Heat without smoke or ashes
Gas, the faithful servant
Gas, the modern fuel

(Continued on page 318)

The Sales Problem is Four-Fold

A Consideration of Gas Merchandising from the Standpoint of an Executive of a Natural Gas Company

By T. J. STRICKLER

Vice-President and General Manager, Kansas City Gas Co., Kansas City, Mo.

OUR problem is to: First, sell proper rates; second, sell gas through proper selling of merchandise; third, sell service; fourth, sell customer ownership.

Rates are probably the most vital single factor in the problem of the utility. An increase in a flat rate to the customer is not always the answer to the problem. Our study of the problem forces us to the conclusion that the proper type of rate is the reservation rate, made up of the customer charge, the reservation charge, and the commodity charge.

Our experience proves that such a rate as opposed to the flat rate (1) increases the number of customers; (2) increases the gas consumption per customer; (3) lowers the average rate per thousand cu.ft.; (4) allows the maximum amount of service and sales with the minimum expenditure; (5) allows consumers to take advantage of a decreased price per unit for quantity purchased, and thereby use gas for purposes that a straight flat rate prohibits; (6) does not penalize the poorer class of consumers; (7) does not penalize the small consumer regardless of his station in life; (8) allows the utility to give better service by enabling it to forecast in advance the demands which will be made upon its lines; (9) forces each class of consumers to pay their just share of expenses they create without penalizing any other class.

Such a type of rate has been approved by various regulatory bodies and has recently been approved by the referee appointed by the District Court of Shawnee County, Kansas, in the Wichita-Hutchinson-Newton gas case. He says:

Abstract of paper given at Oklahoma Utilities Assn. Convention.

"While the three-part rate schedules are a radical departure from the past practice generally followed in fixing the rates of gas companies, yet I find them to be scientifically correct, and to be more fair and equitable in fixing charges to be apportioned among the several different classes of customers than any other system of rates referred to in the evidence. Schedules of rates similar in structure have been in general use by electric light and power companies and some other classes of utilities for some years."

We find that the easiest way to convince the customer or the community as a whole of the advantages of a new rate is to offer them a trial under that rate. There are now a number of such trial reservation rates in effect in Kansas and Missouri, sold through the efforts of the new business department. In Kansas City we have over two thousand such customers. They are practically all satisfied and we expect to add twenty-five hundred more house heating customers under the reservation rate during the present year.

SELLING GAS

In order to sell gas through proper merchandising we have a new business department of which we are proud. Its problem is to increase the volume of business and our experience has proved its ability. It is thoroughly organized. To give an example, in one organization serving approximately 100,000 customers, its personnel consists of approximately 125 men, divided into a domestic division, an industrial division, and a house heating division. These divisions are again subdivided into proper groupings for the efficient carrying on of the work. All activities are budgeted and provide for complete programs for range and other merchandise sales throughout the year, including proper publicity.

Before this property was taken over by our present organization the average total sales of gas amounted to slightly less than five billion cu.ft. per year, and with a constant increase in customers, was showing a slight decrease in sales. Merchandise sales per year were running about as follows: 3900 ranges, 2700 room heaters, 500 tank heaters.

No efforts were being made to sell house heating, nor was there any effort being made to sell industrial gas at proper rates. In 1925 a New Business Department was organized and went into operation in 1926. Special sales campaigns were carried on for ranges, heaters and hot water systems. A complete industrial survey was undertaken and an intensive sales program entered into, employing industrial sales engineers who were competent to analyze the fuel problem peculiar to individual industries and show such industries the benefits to be gained by the proper use of gas. The reservation rate for house heating was introduced and a campaign for house heating carried out. In 1926 the following appliances and equipments were sold: 6466 gas ranges, 3118 room heaters, 139 tank heaters, 745 storage systems, 2138 gas-designed furnaces and conversions, 164 hotel and restaurant ranges, 82 miscellaneous pieces of restaurant equipment, 25 bake ovens, 36 steam and hot water boilers, 425 industrial burners.

The estimated added consumption due to the above sales is as follows:

Water heating	14,900 M cu.ft.
House heating	319,500 M cu.ft.
Industrial, all classes	385,300 M cu.ft.

The average rate applying to these loads is as follows:

Domestic	90 cents
House heating	75 cents
Industrial, all classes	60 cents

The total value of the equipment sold was \$1,163,021, or about \$11.00 per customer, divided as follows:

Domestic	\$693,026
House heating	311,726
Industrial	158,269

In addition to the above sales, the department sold during two ten-day customer ownership campaigns, \$350,000 market value of securities as their share of the total sales of the company.

What is important is not the question of how much profit was made on the merchandise sold, but the relation of the cost of operation reflecting, possibly, losses on merchandise sold, to the increase in consumption, gross revenue and net earnings of the company for which such operations were responsible.

SELLING SERVICE

By "service" I mean the doing of those numerous small things that make your public realize an earnest desire on your part to make it easy for them to secure and use your product.

In order to sell "service" we are utilizing our New Business Department (1st) through house to house calls by district representatives to check up installations and offer suggestions as to improved methods of utilization; (2nd) through our house heating engineers; (3rd) through our industrial representatives who devote their entire time to our industrial customers' problems.

In addition to the above, let me mention a few of the things that some may consider minor, but we consider important.

Business hours—Many utilities do not open their doors until 8:30 A.M. and close at 5 P.M. except Saturday, when they close at 1 P.M. That makes it easy for the office force, but hard for the office man or laborer to apply for gas, pay bills, or buy merchandise. The office of the Kansas City Gas Company is open from 7:30 A.M. to 6 P.M. including Saturday, and we find it pays.

Applications for Service—We are trying to make it easy for a new customer to secure gas. He can telephone in a request for service. He does not have to

(Continued on page 312)

Eastern States Meeting Well Attended

Interesting Program Covering All Phases of Today's Problems
Presented at Two-Day Meeting in Philadelphia



H. H. Newman

division of the American Gas Association. The program committee had carefully selected the topics and speakers, giving an especially well-balanced two-day meeting.

President S. P. Curtis opened the meeting with a short address in which he called attention to the parallel growth enjoyed both by the Conference and the gas industry. Outlining some of the more important developments, such as the industrial gas research program, house heating, etc., he laid stress on the smoke abatement work. In his opinion it will soon be as mandatory for people to keep the air clean as it is for them to keep streams and rivers unpolluted today. He also quoted pertinent figures concerning the unprecedented growth of the industry in the past few years.

The new officers elected are: President, H. H. Newman, Public Service Electric and Gas Co., Trenton, N. J.; first vice-president, C. E. Bartlett; second vice-president, Walter Whetstone; third vice-president, J. A. Frick. J. C. Smith was re-elected secretary-treasurer. L. N. Yetter and F. P. Dugan were elected to the executive committee.

After the usual reports of the various committees and the secretary-treasurer were read and accepted, a telegram of greeting was read from Alexander B.

Macbeth, President of the American Gas Association.

Alexander Forward, managing director of the A. G. A., was the next speaker. In a "Message from the A. G. A.," Mr. Forward emphasized the figures that had been quoted by President Curtis and briefly outlined the important projects under way at the present time, such as the industrial research program, the Blue Star plan, etc. He succeeded in bringing home to the Conference the fact that the progress of the past year has strengthened the industry so that the next year will also be a milestone of achievement.

W. Griffin Gribbel, in reporting for the Educational Committee, called attention to the especially noteworthy feature that members of the faculty from other departments are making it a point to attend the lectures given on the gas industry at the various colleges and universities.

J. W. Heins gave a brief summary of the activities of the Accounting Section of the A. G. A.

Miss Marie L. Obernauer read Mrs. John D. Sherman's paper on "Eliminating the Waste of Human Energy." This was a detailed explanation of the work now being undertaken by the Federation of Women's Clubs of the United States, of which Mrs. Sherman is president. Miss Obernauer told of the survey work that has been under way for two years, and the important part gas is to play in the conservation of human energy by the elimination of human waste.

An inspirational address by Frank Jewel Raymond was well received by the Conference.

"American home life can be retrieved by the return of the housewife to home-cooking," Mrs. Anna. B. Scott, cooking expert and food economist, said in her

address on "The Value of Home Science."

Mrs. Scott, who daily broadcasts scores of timely recipes and cooking hints through the pages of *The Philadelphia Inquirer*, explained the housewife's experience with modern gas ranges. She compared cooking on the newly perfected ranges with the coal stoves of less than a decade ago.

In the discussion that followed Mrs. Scott's paper, several home service directors told of the work they are doing in their respective territories.

An especially interesting paper on "Public Relationship Through Telephone and Order Clerk," was read by H. B. Bryans, of the Counties Gas and Electric Co., Norristown, Pa. He stressed the fact that employees must have more than a pleasing personality, and that a knowledge of every company operation is essential. The training of employees should instill the company's policies in those having to do with the telephone or order departments. Emphasizing the importance of experience in other departments, Mr. Bryans said that starting men as meter readers gave them contact experience. They then should be placed in departments where they would gain service experience and knowledge of the company's routine. He cited a case where there had been a marked falling off in customers desiring to see the manager or some other executive due to employees being unable to give them the proper assistance.

The telephone, in his opinion, is a losing investment unless the operator makes a winning reply. It is important not to try to handle certain problems over the phone, as all problems cannot be handled that way to the best advantage.

In the discussion the fact was brought out that one company has a plan for calling a certain number of customers every day to check up on service. From October 19 to April 2, 5143 calls were made, with replies as follows: 145 needed electric service, 333 gas service, 172 ad-

justments, poor pressure, etc., 33 gas leaks, and 4470 no complaints at all. C. E. Reinicker, of Philadelphia, stressed the need for proper education if that education will make a man better fitted for his job, and Louis Stoecker, of Newark, N. J., described the need for a central organization to handle telephone calls that cannot be allocated properly. In his opinion correct telephone technique should be the aim of all companies.

"Because industry today is in a period of keen competition and narrowing margins of profits, gas is rapidly taking the lead as the most efficient fuel for American manufacturers," said R. E. Ramsay, of the United Gas Improvement Company, Philadelphia, Pa., in his paper on "Competitive Fuels."

Interest in the conservation of natural resources does not influence the manufacturer in his choice of fuel. The final cost of the fuel selected should be based on the overall cost of the finished product. Comparison of the cost of the three competing heat agents—coal, oil, and electricity—is erroneous if made on a B.t.u. basis because it does not make allowance for the higher furnace efficiency of gas, lower labor costs, and the elimination of spoilage or imperfect products.

"Practical Aspects of Resuscitation," was the title of the talk given by Edward Steidle, of the Carnegie Institute of Technology, Pittsburgh, Pa. In plain language he told of the human breathing apparatus, methods of detecting and measuring carbon monoxide poison, etc. A demonstration of the prone pressure method was given, and it was the consensus of opinion that it was one of the best demonstrations ever staged before a similar group of gas men. Mr. Steidle closed his lecture by showing how a cat could be rendered unconscious by carbon monoxide and revived by an adaptation of the prone pressure method and an inhalator.

McCarter medals were awarded to Thomas A. Donnelly and Sylvester D. Sullivan, employees of the Public Service Electric & Gas Co., Newark, N. J.,

for saving human lives from gas asphyxiation. Alexander Forward, managing director, A. G. A., explained the details of each man's act, and presented the medals in behalf of T. N. McCarter, president of the Public Service Electric and Gas Co.

"In the field of social, commercial, and industrial development it is as important for a public utility to upbuild and sustain an *esprit de corps* as it is for a military organization in the field of wartime operations," was the message of P. H. Gadsden, vice-president of the United Gas Improvement Company.

According to Mr. Gadsden the head of a public relations department must be like a cheer leader, to guide, direct and inspire the great army of employees in that cheerful performance of duty which finds its reward in public good-will.

Mr. Gadsden also spoke of governmental interference in private affairs, and the prevailing tendency of appealing to Washington for assistance when anything meets the disapproval of people.

H. D. Valentine, Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y., outlined the domestic load building problem, stressing the importance of the refrigerator, incinerator, and gas-fired house heating appliance. He explained in detail the progress in refrigeration, and told of the expected progress this year.

An outside viewpoint of gas sales was given by W. E. Richardson, Richardson-Briggs Co. The necessity of cooperating with manufacturers in giving the public the most up-to-date appliance was stressed as a capable means of meeting the competition of other fuels.

G. R. Purvis, Household Utilities Corp., substituted for S. D. Heed of the same company, and presented the paper on the laundry dryers, ironing machines, and washing machines as load builders. Mr. Purvis went into detail concerning the advantages of these appliances and explained how they could be merchandised.

J. E. Brewer, Chemical Service Laboratories, Philadelphia, Pa., presented an

interesting paper on "Deposits in Mains, Services, and Meters." Iron compounds, naphthalene, and gummy deposits were the three classes described.

"Automobiles as Major Transportation," was the topic presented by H. W. Howard, General Motors Corp. Mr. Howard carefully reviewed the problems before the transportation department, and explained just how each type of truck, horse-drawn, electric and gasoline, have a separate and distinct function. In his opinion lost time is the most costly item that has to do with truck operation.

A symposium on the successful sale of automatic storage water heaters was the last thing on the program. J. Everett Brown, Ardmore, Pa., told of the success met with by using house-to-house calls, when backed by the proper advertising. He also stressed the necessity of salespeople being thoroughly instructed in the features of the automatics.

Mr. Folge, Poughkeepsie, N. Y., brought out the need for cooperating with the plumbers.

B. H. Atwood, Wilmington, Del., discussed trial installation as a stimulus for sales, and gave facts and figures, that proved the success his company has had with this method.

Jos. Bees, Scranton, Pa., explained the large volume water heating problem, and told of a coal mine that had installed a gas-fired water heater.

Jacob B. Jones, Bridgeton, N. J., gave an interesting sidelight when he told of the tie-up his company had made with the Ruud Light Opera Hour, now being broadcast regularly over the radio.

F. J. Lehnert, Trenton, N. J., outlined the success his company has had with large volume installations in schools, stadiums, etc. He stressed the need for complete equipment to give efficient service.

On Friday evening, April 8, the annual banquet was held at the Bellevue-Stratford. The Hon. Harold B. Wells, formerly Judge, District Court and State Senator, was the speaker.

TIDE OF MEN AND AFFAIRS

George Ramsdell Honored By Executive Board



G. G. Ramsdell

GEORGE G. RAMSDELL, librarian of the American Gas Association, was presented a leather case containing two Dunhill pipes by the Executive Board of the Association at its regular April meeting, Wednesday, April 13. The presentation was made in honor of Mr. Ramsdell's seventy-ninth birthday, the 30th of April.

Alexander B. Macbeth, President of the Association, made the presentation for the Board, calling attention to the length of service and the splendid record of Mr. Ramsdell.

"In Mr. Ramsdell's experience of 50 years in the gas business," said Mr. Macbeth, "he has seen 47 years of association work, is now and has served as secretary of the Society of Gas Lighting for 23 years. There is no man more widely known or more generally honored in the esteem of the industry.

"In spite of his many years in the business and his wonderful age he is very different from most of us when we get old. He has still a very youthful spirit. He does not sit around and tell how much better they used to do things in the old days. He states that everything is done better now than it used to be."

In expressing his thanks, Mr. Ramsdell told of his desire to carry on in the gas industry as long as he lives.

Mr. Ramsdell is a member of the famous Old Guard of the industry, of which only six are living today. He was born in Providence, R. I., in 1848. Completing a course at Vincennes University in 1863, he undertook to organize a company to heat Vincennes, Ind., from a central plant. Officials of the Citizens Gas Company became interested in the project resulting in his appointment as manager and treasurer in 1877. On March 20, 1927, Mr. Ramsdell completed his fiftieth year in the gas business.

He held this position until 1890 when he became general manager of the American Gas Company, at Philadelphia. In 1905 he became President of the Ramsdell Inverted Lamp Company. In 1911 he was elected secretary and treasurer of the American Gas Institute.

Mr. Ramsdell is known as the "perennial secretary" of the Society of Gas Lighting, having held that position since 1904. He is also a past president of the Western Gas Association, the American Gas Light Association, and is an honorary member of the Ohio and French Associations. In 1900 he was one of the two American Association officials to attend the International Gas Congress at Paris.

He has been a member of the American Gas Association headquarters staff since the formation of the association.

CHARLES F. HENDERSON, who for the last two years has been superintendent of the Gas Department of Toledo Edison Company, Toledo, Ohio, has gone to the Republic Light, Heat and Power Company, Tonawanda, N. Y., where he is superintendent of manufactured gas operations.

L. F. BABCOCK has been transferred from superintendent of the Gas Department of the Danbury & Bethel Gas & Electric Company, Danbury, Conn., to the Pueblo Gas and Fuel Company, Pueblo, Colo., as general superintendent.



Mrs. L. M. Fisher

MRS. LUELLA M. FISHER, home service director of the Erie Stove and Manufacturing Company, Erie, Pa., has the honor of being the first woman to enter the Home Study Course on Manufactured Gas offered at Columbia University under the auspices of the American Gas Association.

In her work, Mrs. Fisher has found that general lectures on gas service are received with a great deal of interest by the various audiences she addresses.

More than 1000 students are now enrolled in the Home Study Course.

GEORGE W. THOMPSON, formerly general manager of the 15th Street District Office of the Consolidated Gas Company of New York, N. Y., has retired from active service. Mr. Thompson has been in active service of the company for approximately 40 years. He has been succeeded by W. D. MacFarlane, formerly assistant manager.

Other promotions announced by the company are as follows: J. F. Kane, from chief clerk to assistant manager, and R. J. Phillips, from assistant chief clerk to chief clerk.

FOLLOWING THE RECENT resignation of Merrill E. Skinner, commercial manager of the Duquesne Light Company, a subsidiary of the Philadelphia Company, Pittsburgh, Pa., a general sales department to include that of the light company, the commercial department of the Equitable Gas Company and the Equitable Sales Company was created and George E. Whitwell was appointed general sales manager, effective April 1. Mr. Skinner left to accept a similar position with the Mohawk and Hudson Power Corporation, with headquarters at Albany, N. Y.

Mr. Whitwell comes of a family of public utility men of Washington, D. C., where he was born in 1892. He was graduated from Massachusetts Institute of Technology in 1915 and until June, 1918, became analytical and research chemist with the Anaconda Copper Mining Company, leaving that field to serve as a private in the photographic air service of the Army in France until April, 1919. In June, 1919, he joined the Washington state geological survey and in June, 1920, became research investigator of the Seattle Lighting Company.

He taught chemical engineering for three years at the University of Washington jointly serving as consulting engineer for the Tacoma Gas and Fuel Company and in October, 1922, became vice-president of the Young-Whitwell Gas Process Company, formed by himself and D. J. Young, manager of the Tacoma concern.

In May, 1924, Mr. Whitwell became manager of the new business department of the Tacoma Gas and Fuel Company and in May, 1925, became manager of the gas department of the Byllesby Engineering and Management Corporation. In the fall of 1926 he became general manager of the Equitable Gas Company, which position he held until the creation of the new department which he now heads.

W. A. HIDDLESON, for several years manager of the Bristol Gas & Electric Company, Bristol, Tenn., has resigned to become sales manager of the Reynolds Company, of Louisville, Ky., investment bankers, in association with Barney & Company, of New York City. He joined the Doherty organization in 1912 as general manager of the Central Service Company of El Campo, Texas. In 1919 he was transferred to the management of the Bristol Gas & Electric Company and has held that position since.

JOSEPH B. TOWNSEND, 3d, treasurer of The American Gas Company, has been elected an assistant treasurer of The United Gas Improvement Company, Philadelphia, Pa., and Johns Hopkins, secretary of that company, an assistant U. G. I. secretary. These are additional offices.



A. L. Spears



F. M. Nilan

Recent changes in the personnel of Westchester Lighting Company, Yonkers, N. Y., are interesting in the fact that those promoted have progressed through the ranks of the company from positions of messenger, stenographer, bookkeeper or office boy to their present positions.

Frank M. Nilan, former assistant to William Judson Clark, vice-president, is now assistant secretary of the company. Albert L. Spears has been promoted from general office cashier and paymaster to assistant treasurer. Thomas B. Murtha, formerly of the President's office, is now assistant director of the personnel bureau. J. P. McLaughlin, who came up the ladder from bookkeeper to assistant auditor, has now been promoted to chief clerk.

Mr. Nilan's election to his position as an officer of the company was made known at a meeting of the board of directors in New York. The event was unusual, inasmuch as it meant the elevation to an officership of a young man hardly out of his "twenties."

Mr. Nilan came to the company on May 4, 1914. His first position was that of messenger.

CHARLES A. SEMRAD, vice-president and commercial manager of the Public Service Company of Colorado, Denver, has been made vice-president and general manager of the St. Joseph, Mo., Railway, Light, Heat & Power Company. He succeeds S. B. Irelan, who for the past four years has been general manager of the St. Joseph company and whose appointment as Western manager of the securities department of Henry L. Doherty & Company was announced recently. Mr. Semrad is a graduate of the University of Wisconsin, class of 1907. In 1912 he became associated with the Boulder, Col., office of the Northern Colorado Power Company, which in 1915 was reorganized under the name of the Western Light & Power Company. In 1914 he assumed the management of the Cheyenne Light, Fuel & Power Company in Cheyenne, Wyo., a subsidiary of the Northern company, and later

become manager of the Western Light & Power Company's properties, with headquarters at Boulder. In December, 1918, the Henry L. Doherty interests took over the Western company, and six years later Mr. Semrad was transferred to Denver to assume the duties of vice-president and commercial manager, which position he has held until his recent promotion.



B. J. Mullaney

has resigned his position to join the commercial department of the Central Hudson Gas and Electric Corp., at Poughkeepsie, N. Y.

G. I. VINCENT, vice-president and manager of the Syracuse Lighting Co., Syracuse, N. Y., spoke recently before a meeting of the Society of Engineers of Eastern New York at the Rensselaer Polytechnic Institute, Troy, N. Y. The topic of his address was "An Old Industry at a New Threshold."



Horace H. Clark

the University of Missouri School of Mines in 1905, he worked in various capacities for the Laclede Gas Light Company of St. Louis, in the electrical and gas operating departments. Since 1908 he has been with the Insull Interests (Public Service Company of Northern Illinois, The Peoples Gas Light and Coke Company, and others) in several important positions; until 1916, in engineering and operating departments, since 1916, in sales work.

During the last few years he has also done consulting sales work for such companies as Laclede Gas & Electric Company, Columbia

BERNARD J. MULLANEY, vice-president of The Peoples Gas Light and Coke Company, Chicago, Ill., has been elected President and chairman of the advisory board of the Chicago Safety Council.

THOMAS JABINE, who has been with the Merco Nordstrom Valve Company as district manager for New York, N. Y.,

Gas & Electric Company, Illinois Power & Light Company, United Light & Power Company, and others.

N. J. Public Service Has Year of Great Progress

THE annual report of the Public Service Corporation of New Jersey for 1926, which covers operations of the corporation and the subsidiary companies, was recently distributed.

Increase in the volume of gas sales by the gas department amounted to more than 1,800,000,000 cu.ft., total sales reaching 22,165,086,730 cu.ft. There was a gain for the year of 30,286 meters, the number in service on December 31, 1926, being 705,550. Other notable incidents from the record are:

A gain of nearly 15 per cent in the volume of sales for industrial use, the total reaching a figure of 3,872,574,900 cu.ft.

A gain of more than a quarter of a million dollars in revenue received from the sale of gas appliances, the total being \$2,825,238.

The construction of 265 miles of new main, bringing the total mileage of the system up to 4,130.

Sales of gas by Public Service have increased by thirty-three per cent in the last five years and that in the same period there has been a gain of more than twenty-four per cent in customers.

Silver Anniversary

THE American Stove Company has now completed its twenty-fifth year, having commenced business on January 7, 1902.

A particularly attractive issue of the *Magic Chef*, the company's house organ, covers the high spots of the company's career.

GAS SAFETY CODE NOW PERMANENT STANDARD

WITH great pleasure and gratification we announce that the Gas Safety Code, prepared by the American Gas Association and the U. S. Bureau of Standards, approved December 28, 1925, by the American Engineering Standards Committee as Tentative American Gas Safety Code, having stood the test of time, has been approved as Permanent American Gas Safety Code by the American Engineering Standards Committee as of March 10, 1927.

This Code was prepared as a result of a long period of research and preparation by a Committee of which Mr. Walter R. Addicks, Senior Vice-President of Consolidated Gas Company of New York was Chairman.

Copies of the Code may be obtained from Association headquarters at a price of twenty cents per copy.

Affiliated Association Activities

Illinois Gas Association



P. D. Warren
Springfield; Directors: B. J. Mullaney of Chicago, H. S. Whipple of Rockford, R. E. Chew of Bloomington, R. B. MacDonald of Moline, R. S. Wallace of Peoria, Charles W. Bradley of Chicago, J. E. Johnson of Chicago, E. E. Lundgren of Aurora, and Harry Channon of Quincy.

In an exclusive interview with a special correspondent of the MONTHLY Mr. Warren, the new President of the Illinois Gas Association, gave out the following statement:

"No time during my thirty years of experience in the gas business have the fields in which the gas business might develop been more interesting than it is at the present time. It is only within the past few years that the possibilities in the industrial and house heating fields have been fully realized. In addition to these activities, there is water heating, incineration and refrigeration. Then too, there is the excellent work done by the various home service departments in offsetting serious inroads upon our existing domestic business as well as increasing sales per meter in many cases.

"The work of the Illinois Gas Association has been along the same general lines as that of the American Gas Association. The Illinois Association points with pride to the many papers presented at the various conventions by guests and members.

"Another activity of the Association is that of the work done at the University of Illinois. Short courses for industrial gas engineers, as well as meter readers, are held at the state university during the summer months. Industrial gas equipment is used extensively in the university laboratories, and for 10 years the Association has maintained two scholarships at a total cost of \$12,000.

"Notwithstanding the many achievements of the Association and the wonderful progress

THE officers elected for the ensuing year at the convention of this Association, held in Springfield, Ill., March 17 and 18, 1927, are: President, Paul D. Warren, The Peoples Gas Light & Coke Company, Chicago; vice-president, J. A. Strawn, Central Illinois Light Company, Peoria; secretary-treasurer, R. V. Prather,

made within the state during the past few years, I look forward to 1927 being a banner year. The large attendances at the conventions and the interest taken in the papers presented by those discussing them demonstrates the excellent spirit which prevails through the entire Association and accounts for in a large degree, the success of the gas companies within the State of Illinois."

New England Gas Association



A. H. Scott
huff of Boston, I. T. Haddock of Cambridge, and A. S. Hall of Springfield, Mass.

The Board of Directors of the New England Gas Association, at a meeting in the Chamber of Commerce Building, Boston, on March 26, 1927, appointed Everett A. Taylor to serve as secretary for the coming year.

The next meeting of the Operating Division will be held in New London, Conn., May 6 and 7, 1927. V. E. Bird, vice-president and general manager of the Connecticut Power Company at New London, will arrange to have a paper presented describing the new water gas plant of that company. Mr. Bird will also have a paper presented on the leveling of a 1,000,000 cu.ft. holder, work on which will be started soon. It is expected that the contractors should be in the midst of this holder job at the time of the meeting so that the members attending will get a good idea as to how it is done.

Canadian Gas Association

THE plans for the convention of the Canadian Gas Association to be held in Toronto, Ont., Thursday and Friday, July 16 and 17, 1927, are well under way. The general sessions will be held at the Royal Canadian Yacht Club on Toronto Island on the morning of each day. Luncheon will be served at the Yacht Club.

One afternoon will be devoted to an inspection of the plant of the Consumers Gas

Company to see recent additions which include a new 4,000,000 cu.ft. waterless holder, a large Glover-West vertical retort installation, and other features. The other afternoon will be given over to an inspection of the industrial and new business division of the Consumers Gas Company. A number of papers have been promised on such subjects as: "Advantages and Disadvantages of Dry Quenching of Coke," "Lead Bath System of Tar Distillation," "Drying of Gas," "Naphthalene Removal," "Waste Heat in Gas Works," "House Heating with Gas," and "Super Power Systems of Gas Distribution." A boat trip around Toronto Island and the harbor and a sightseeing trip around the City of Toronto is being planned for the ladies.

Empire State Gas & Electric Association



O. H. Smith

AT the annual meeting of the Gas Section of this Association held at Briarcliff Manor, N. Y., March 10 and 11, Oliver H. Smith of the Consolidated Gas Company of New York was elected chairman, and Joseph Lucena of the Syracuse Lighting Company was elected vice-chairman. The annual meeting of the Accounting Section will be held at the Hotel Niagara, Niagara Falls, N. Y., on Thursday and Friday, May 5 and 6, 1927. Ernest Johnston, secretary of the Syracuse Lighting Company, is the chairman of the Section.

The program will include addresses by H. M. Brundage, president of the Association, and W. Paxton Little, vice-president and treasurer of the Niagara Falls Power Co. There will be reports from H. C. Davidson, chairman of the sub-committee on Public Service Commission and Tax Commission Records, and J. I. Blanchfield, chairman of the sub-committee on Fixed Capital Records. The chief engineer of the Public Service Commission, C. R. Vanneman, will tell of complaints and inquiries reaching the Commission and traceable to methods, practices, and acts coming within the activities of the Accounting Departments of Gas & Electric Companies. F. J. Brett, assistant treasurer of the Buffalo, Niagara and Eastern Power Corporation will tell of new developments in commercial accounting practice and H. L. Davis, of the New York Telephone Company, will speak on accounting department selection and training.

Following a brief talk by W. K. Bradburg of the Niagara Falls Power Company, on the

story of Niagara Falls, the delegates will have an opportunity of seeing the plant and developments.

There will be two general sessions, one on Thursday morning and one on Friday morning, and an opportunity will be afforded in the afternoons to those desiring to play golf to do so.

The Commercial Section of the Empire State Gas and Electric Association will hold its annual meeting at Elmira, June 21 and 22, 1927. The program of the meeting has been announced by E. L. Wilder of the Rochester Gas & Electric Corporation, chairman of the section. This will include committee reports on the following subjects: "Home Service," by R. V. Howes of the Consolidated Gas Company of New York; "Industrial Gas Sales," by W. J. Reagan of the Utica Gas & Electric Company; and "Gas and Electric Merchandising," by H. C. Wilder of the Northern New York Utilities Corp. In addition to the above, the section plans some special talks and addresses. The sessions will be held Tuesday morning and evening, June 21, and on Wednesday morning, June 22. This will leave the afternoons free for recreation.

The annual meeting of the Women's Section of the Empire State Gas & Electric Association will be held at the Hotel Van Curler, Schenectady, N. Y., Thursday and Friday, May 26 and 27, 1927.

Indiana Public Utility Association

THIS Association will hold its annual convention on Friday, May 20, 1927, at French Lick, Indiana. The meeting will be a joint one with the Indiana Electric Light Association and the Indiana Gas Association and the program will be chiefly devoted to the subject of public relations. The Indiana Gas Association will hold a separate meeting on Thursday, May 19, 1927, and the Indiana Electric Light Association will hold a similar meeting on Saturday, May 21, 1927.

The morning session of the Indiana Gas Association will run from 9.30 to 12.00 o'clock while the afternoon session will run from 2.00 to 4.00 o'clock. The program will open with an address by the President, Ernest Van Arsdel of Indianapolis. During the day the following papers will be presented:

"Selling the Gas Bill," by Miss Irene Lennon of Fort Wayne

"Water Heating," by F. X. Mettenet of Hammond

"Blue Star Home Plan," by J. B. Wilson of Aurora, Ill.

"Two Part Gas Rate," by B. H. Gardner of Hammond

"Selling Central House Heating," by F. C. Mackey of Chicago.

There will also be a movie reel and talk

by R. E. Bennett of Chicago on "Insulation and Its Value to the Gas Company and Home Owner." The conventions of this Association have always been characterized by programs of value interestingly presented.

Pacific Coast Gas Association

A JOINT meeting of the Pacific Coast Gas Association and the Arizona Utilities Association, which bids fair to become an annual event, will be held in Flagstaff, Arizona, on Thursday and Friday, May 26 and 27, 1927.

George T. Herrington, general manager of the Flagstaff Electric Light Company, is chairman of the Entertainment Committee; Claude S. Webber, superintendent of the Tucson Gas Electric Light and Power Company, is chairman of the Program Committee; W. C. Hornberger, assistant general manager of the Central Arizona Light & Power Company, is chairman of the Attendance Committee, while Ben Ferguson, secretary of the Arizona Utilities Association, is chairman of the Finance Committee.

It is expected that the attendance at the meeting will include public utility men from Arizona, Colorado, New Mexico, and California.



J. L. Stone

THE Northwest Conference of the Pacific Coast Gas Association will be held in the Hotel Davenport, Spokane, Washington, Friday and Saturday, May 6 and 7, 1927. The first session will be held on the afternoon of May 6. At this session a paper will be read by J. F. Polard, of the Coast Valleys Gas & Electric Co., entitled "Public Relations for Gas Companies." Following this a discussion on the value of organizing women employees will take place. The remainder of the afternoon will be devoted to a discussion of electric competition by H. M. Crawford of the Pacific Coast Gas & Electric Co., H. E. Seagraves of the Tacoma Gas & Fuel Co., L. H. Stratford of the Pocatello Gas & Power Co., A. A. Salmon of the Spokane Gas & Fuel Co., C. E. Lasher of the Puget Sound Gas Co., George Smith of the Southern Counties Gas Company and others. There will be a dinner on the evening of May 6 followed by inspirational talks, entertainment and dancing.

On the morning of May 7 there will be a paper on "Industrial Gas" by James J. Ferrari of the Puget Sound Power and Light Company. This will be followed by a discussion

on recent legislation affecting public utilities; Norwood W. Brockett of the Puget Sound Power and Light Company will discuss legislation in Washington, George L. Myers of the Pacific Power & Light Company will discuss Oregon legislation and Allen L. Cleveland of the Southern California Gas Company will discuss legislation in California.

Sufficient time will be allowed for an informal discussion of committee work conducted by the chairmen of the four major sections of the Association. The afternoon will be devoted to sightseeing and informal committee conferences. J. L. Stone is in charge of all local arrangements.

New Jersey Gas Association



J. L. Conover

THIS Association held a brief meeting on April 7, 1927, between the sessions of the Eastern States Gas Conference in Philadelphia at which the following officers were elected: President, John L. Conover of Newark; first vice-president, R. A. Koehler of Newark; second vice-president, H. A. Stockton of Atlantic Highlands; secretary-treasurer, Louis Stoecker of Newark; directors, S. DuBois, B. F. Buck, and R. B. Richardson. Secretary Stoecker reported an increase in membership from 756 to 892 during the past year.

Pennsylvania Gas Association



J. A. Weiser

THE 19th Annual Meeting of the Pennsylvania Gas Association was held in the Bellevue-Stratford Hotel, Philadelphia, on April 6, 1927, the day before the opening of the Eastern States Gas Conference. The meeting opened with a splendid address by the President, A. C. Taylor, and during the day two excellent papers were presented, one on "New Business Campaigns" by B. F. Pickard and the other "Fitting the Advertising to the Purpose" by W. F. O'Donnell. "Service to Customers from the Distribution Department Standpoint" was the subject of a round table discussion participated in by H. S. Bair, G. W. Phillips, W. C. Anderson, W. G. Sterrett, R. J. Ott, and William Naile. The following officers were elected:

President, J. A. Weiser; 1st vice-president, J. J. McKnight; 2nd vice-president, H. H. Miller; 3rd vice-president, L. S. Williams; and secretary-treasurer, G. L. Cullen. The following were elected to membership on the council: J. S. Fees, Luther Deal, J. A. Frick, H. A. Llewellyn, Mark Pendleton, Joseph Jeffrey, and W. F. Swayze. The reelection of George L. Cullen for the seventh time as the secretary-treasurer is fitting recognition of the efficient work he has performed in that office. It is with his able assistance that the Pennsylvania Gas Association is able to report a membership of 745.

Oklahoma Utilities Association



E. R. Ernsberger

REPRESENTATIVES of natural gas companies operating in Oklahoma and other states in the southwest contributed materially to the success of the Oklahoma Utilities Association convention at Oklahoma City March 8, 9, and 10. Representatives of the electric railway, telephone, and manufacturing industries also participated in the convention, the total attendance reaching 825.

The general sessions held each forenoon were addressed almost exclusively by prominent utility executives and operators from outside of Oklahoma. These sessions assumed the importance of a national convention as far as the quality of the addresses was concerned.

Each afternoon of the three days was devoted to sessions of the various divisions of the Association. More time was allotted to the Gas Division than in any previous convention, this division having three full afternoons in which to put on its part of the program. Gas Division meetings were held on the eleventh floor of the Skirvin Hotel. The meetings were presided over by H. L. Montgomery, manager, gas division, The Empire Companies, Bartlesville, and division chairman. The division decided to retain the Southwestern Gas Meter Short Course, which is put on annually at the University of Oklahoma at Norman, and the Gas Conservation School, which meets annually at Bartlesville, Oklahoma. These activities will continue to be sponsored by the Oklahoma Utilities Association.

Among those who addressed the Gas Division sessions and their subjects were: Logan Cary, Oklahoma City, gas superintendent, Oklahoma Gas and Electric Company, "The

Conservation School"; C. W. Robbins, Ponca City, general superintendent gas division, Oklahoma Northern Utilities Company, "Gas Company Public Relations"; F. D. Renfro, Bartlesville, The Empire Companies, "The General Construction and Operations of Compressor Stations and Their Relations to the General Operation of the Pipeline System"; W. J. Armstrong, Oklahoma City, chief conservation officer, Corporation Commission of Oklahoma, "Cooperation as a Factor in Conservation"; R. W. Hendee, Tulsa, general field superintendent, Oklahoma Natural Gas Corporation, "Corrosion of Pipe Lines"; J. W. Duvall, Oklahoma City, Oklahoma Gas and Electric Company, "Scientific House Heating"; Dr. H. C. George, Director, School of Petroleum Engineering, College of Engineering, University of Oklahoma, "Relation of Petroleum Engineering to Gas Industry"; A. A. Naulin, Milwaukee, Home Incinerator Company, "Incineration"; John Crout, Kansas City, The Gas Service Company, "Distribution System Leakage"; J. H. Baxter, Oklahoma City, gas engineer, Oklahoma Gas & Electric Co., "The Gas Meter School."

T. J. Strickler, Kansas City, manager, Kansas City Gas Company, addressed the general convention program on "Natural Gas and the Public."

Among interesting entertainment features of the convention were the annual reception and ball on Tuesday night, March 8, and the annual banquet and entertainment Wednesday night, March 9. More than 400 public utility men and women participated in this banquet. The principal speaker was Earl W. Hodges, New York City, director public relations, Henry L. Doherty and Company.

The following officers of the Association were elected: President, Earl R. Ernsberger, Oklahoma City; first vice-president, L. W. Scherer, Yale; second vice-president, H. L. Montgomery, Bartlesville; treasurer, W. R. Emerson, Oklahoma City; manager, E. F. McKay, Oklahoma City. Members of the executive board: Electric Light and Power Division, J. F. Owens, Oklahoma City; Gas Division, H. L. Montgomery, Bartlesville; Electric Railway, H. B. Cobban, Miami; Public Relations Division, L. P. Arnold, Tulsa, and George Ade Davis, Oklahoma City; Manufacturers and Suppliers Division, Chas. Skove, Oklahoma City; Telephone Division, J. A. Winton, Mulhall, and A. C. Oliver, Shattuck. There are also several holdover members of the Executive Board. Division Chairmen—Electric Light and Power Division—Fred W. Insull, Tulsa; Gas Division—J. B. Porter, Tulsa; Electric Railway—H. B. Cobban, Miami; Public Relations Division—Keith Clevenger, Bartlesville.

ACCOUNTING SECTION

A. L. TOSSELL, Chairman

EDWARD PORTER, Vice-Chairman

H. W. HARTMAN, Secretary

High Desks vs. Low Desks

By J. W. SCHERER

Accounting Service Dept., Consolidated Gas, Electric Light and Power Co., Baltimore, Md.

FOR many years a style of furniture known as the high bookkeeper's desk has been in use in this company, especially in the billing and balancing departments.

This style of furniture was well adapted to the methods and records in use. The company, prior to the war, kept its billing records in large steel and fibre binders weighing from ten to thirty pounds. These ledgers were kept in large omnibuses during the day and were wheeled into the vault each night for protection against fire, etc.

During these years of large ledgers, very few female clerks were employed in these departments and practically none handled the heavy ledgers. However,

many changes were brought about during the World War; men were enlisting and being drafted into the service of our country, making it necessary to employ female clerks, for whom the ledgers were too cumbersome and too heavy to handle. It then became necessary to investigate other methods of handling our consumer's accounts.

After careful study and many trying experiments the present method of bookkeeping without books or "The Baltimore System" was installed. This plan has been a great success and has been the means of retaining female help in these departments to the present time.

Figure 1, taken during January, 1926, gives an idea of the high bookkeeper's



Fig. 1: High bookkeepers' desks



*Left, Fig. 2
Below, Fig. 3*

desk which portrays clearly the discomfort of the employees perched on the high stools. This brought about another question, i.e., the comfort of the employees and the obsolescence of the high desks.

A trial installation of low desks was made and after a period of approximately one year it was felt that the low desk afforded the clerks more comfort and resulted in less physical fatigue after the day's work was completed.

Figure 2, taken during June, 1926, shows a partial installation of low desks with the high desks shown in the rear. This picture gives a good example of the comfort of the employees at the low desks against the discomfort of those at the high desks.

Figure 3 shows a complete change from high to low desks, in the east section of the Billing Department.



Figures 2 and 3, without a doubt, clearly show: First: That the low desks are more practical. Second: That better supervision is afforded. Third: That better ventilation is made possible.

So. California Gas Has Good Year

ON March fifteenth, the Southern California Gas Company issued its financial report for the year ending December 31, 1926.

During the year 1926, the Southern California Gas Company gained 15,504 customers, making a present total of 183,576. A sum of \$2,802,654 was expended during the year for extensions and betterments, bringing the total value of the Company's property to \$36,067,880.

PUBLICITY AND ADVERTISING SECTION

HARLOW C. CLARK, Chairman

E. FRANK GARDINER, Vice-Chairman

CHARLES W. PERSON, Secretary

Direct Mail Advertising Sells Stock

Ice Company Uses This Form of Advertising to Sell \$300,000.00 Worth of Customer Ownership Stock

By A. E. BURGESS

THE Southern Ice & Utilities Company, a large corporation of the Southwest having headquarters in Dallas and thirty-nine ice plants in thirty-three towns and cities in Texas, Oklahoma, Arkansas and Louisiana, has just completed a novel and very successful customer ownership preferred stock selling campaign which was put across mainly by direct mail advertising. In all, more than 125,000 pieces were sent through the mails.

The first necessary step was to get a list of all likely prospects. To this end, each local manager in the towns and cities served by the company sent in a telephone book in which he had previously checked the names of all probable prospects for the purchase of shares. This list when compiled was found to comprise 60,000 names.

As a second step, each wagon-salesman in every town turned in a list of the fifteen customers on his route who, in his opinion, were especially promising prospects. These lists were found to total 5460 names.

The first piece of direct mail advertising, which was sent to the entire list of 60,000 names, was timed to reach the prospect three days ahead of the opening of the selling campaign. A 15½ x 21¼ broadside, captioned "Two Men Who

THE use to which this ice company put direct mail advertising was as unique as it was productive of results. This form of advertising can be used by public utility companies as a valuable partner to the other forms of publicity and advertising. The problems before the Southern Ice and Utilities Company in selling their customer ownership stock were much the same as those faced by gas companies in selling their service to the public.—EDITOR.

Have Made Industrial History," it contained the pictures and business stories of C. W. Dawley, president and founder of the Southern Ice & Utilities Company and of H. C. Couch, a prominent director. The folder set forth the personality and business history of each and gave

facts about the growth of the company during the forty years of its business history, concluding with a statement that an early announcement would be made as to how the public could "build their futures along with these men."

Piece No. 2 was also a broadside of the same size which explained the details of the customer ownership stock offer, set forth nine points which were favorable to the security as an investment and invited the recipients to use the attached card to ask for the details of the plan. This piece was sent to 55,000 prospects. The actual number of cards returned was not large when expressed in numbers, but was considered quite satisfactory to the company, as it was not their object simply to sell a quantity of stock, but to sell stock to their own customers and others whose good will might prove a business asset. Of the prospects who did ask for further information by returning these cards seventy per cent later bought shares.

Piece No. 3, which was sent to all of the 5460 names turned in by employees,

From "The Mailbag."

was a folder similar to piece No. 2 except that it bore on its front an individualized letter. Return cards were also used on this piece. Pieces two and three were mailed at the same time, as the lists had been checked for duplications, and were so timed that they reached each town on the evening preceding the opening of the campaign.

SELLING CAMPAIGN

Following the preliminary barrage laid down by the direct mail advertising the actual selling campaign was begun. The manager of each ice plant was furnished with window cards, wagon posters and a sufficient number of red tags to be placed on the knob of each refrigerator which the employees were in the habit of filling. It was later found that these tags, which explained some of the details of the stock offer and had a section to be detached and returned for more information, nearly always were taken direct to the head of the house and aided materially in putting across the stock sales.

Just prior to the opening of the sales campaign, Hugh N. Leiper, advertising manager of the corporation, and L. W. Dawley, an official, made at least two visits to each of the towns in which the company had plants for the purpose of explaining the campaign to the employees and instructing them in methods of selling. The employees were told that they, too, might buy shares, and at a slightly lower price than that offered the public.

The stock-selling goal was passed before the campaign was over. A total of \$300,000 worth of stock par value \$100 was sold to 957 individuals at a cost of \$16,500, or \$5.50 per share.

An immediate increase in the loyalty and quality of service among the employees was noticed and a perceptibly better feeling toward the company by the public has resulted. Officials of the company are very much pleased with the results.

In Memoriam

Mrs. B. J. Mullaney, Chicago, Ill.
James T. Cortelyou, Philadelphia, Pa.
E. E. Corden, Central Illinois Light Co.,
Peoria, Ill.
Henry C. Schaper, Milwaukee Gas Light
Co., Milwaukee, Wisc.

New Officers

THE following officers were elected at the recent annual meeting of the New England Association of Commercial Gas Managers, held at Worcester, Mass.: President, Howard B. Hall; vice-president, Shirley A. Mace; secretary-treasurer, L. B. Whittemore.

Spring Conference

THE meeting of the Executive Board and the Advisory Council for the annual Spring Conference will be held at the Traymore Hotel, Atlantic City, N. J., June 3 and 4.

Book On Newspaper Advertising Available

GOOD Copy," a book dealing with the technique of newspaper advertising prepared by the Bureau of Advertising of the American Newspaper Publishers Association, can be secured from the American Gas Association free of charge. Since the majority of gas company advertising is done in the daily newspapers, this book will be in large demand. As only a limited number of copies are available, requests will be filled in the order received.

HEADQUARTERS NOW AT NEW OFFICES IN NEW YORK

THE Headquarters office of the American Gas Association is now located in the new Graybar Building, 420 Lexington Avenue, New York, N. Y., 43rd and 44th streets. The new offices are on the fifth floor, with entrance through Room 550. The new telephone numbers are Lexington 1407, 1408, and 1409.

MANUFACTURERS SECTION

W. E. STEINWEDELL, Chairman

H. L. WHITELAW, Vice-Chairman

C. W. BERGHORN, Secretary

Plans for 1927 Exhibition Under Way

Exhibition Committee Already At Work to Make Show
at Chicago Even Better Than That of Last Year

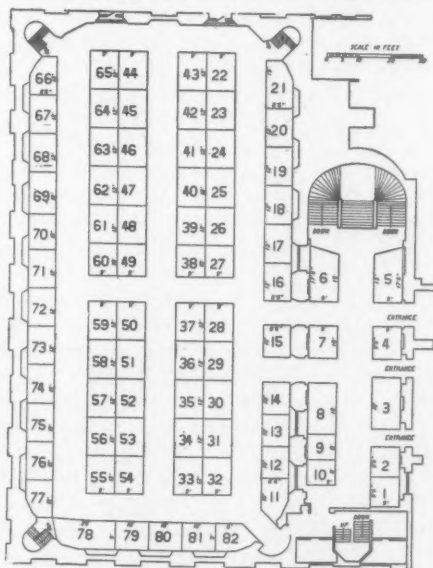
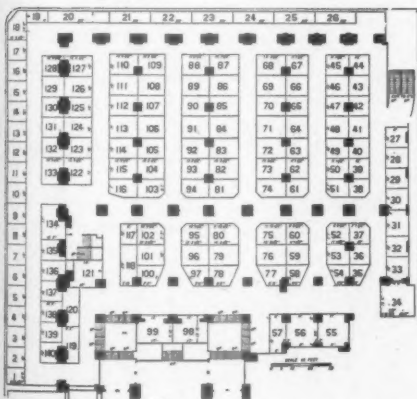
MANUFACTURER members of the Association received the announcement that the ninth annual convention of the A. G. A. will be held in Chicago, Ill., at the Hotel Stevens, with favor. With the splendid exhibitions that have been staged in Atlantic City as a stimulus for achievement, the 1927 Exhibition Committee has tried to make every provision for an even better show for the coming convention. Articles in future issues will give facts and figures about the Hotel Stevens, the world's largest hotel, that make it especially suitable for the 1927 convention.

Having met in Atlantic City for five successive years, the meeting in Chicago will give the manufacturers an opportunity to exhibit their products before a large number of customers who have not been able to attend the conventions at Atlantic City.

The space available for exhibition pur-

poses at Chicago is considerably less than the amount of space actually used at the 1926 convention on the Million Dollar Pier. This coupled with the usual annual increase in the number of exhibitors has prompted the Exhibition Committee, in its prospectus, already sent to manufacturers, to make a special request that all companies applying for space make their demands as conservative as possible. The Committee will make every effort to accommodate all applicants for space, which will necessitate the limiting of the amount of space used by any one exhibitor.

The growth in the number of exhibitors at the A. G. A. conventions is shown in the following figures: In 1919 there were



Right: Plan of booths for the exhibition hall in the basement of the Stevens Hotel. Left: Plan for the grand ballroom on the second floor

110 exhibitors; in 1920, 110; in 1921, 112; in 1922, 135; in 1923, 165; in 1924, 182; in 1925, 208, and in 1926, 222. The largest amount of space ever used for an A. G. A. exhibition was in 1926, when more than 56,000 sq. ft. net were used on the Million Dollar Pier.

Because of the decrease in amount of space available, the manufacturers are requested to make their space reservations early, as no guarantee can be made to provide for tardy requests.

The Exhibition Committee is composed of the following: Chairman, W. E. Steinwedell; B. S. Beach, R. K. Clark, E. V. Daly, C. B. Phillips, and C. W. Berghorn, director of exhibits. All correspondence referring to the exhibition should be sent to the Director of Exhibits, American Gas Association, 420 Lexington Ave., New York, N. Y.

Mirroring the Future

(Continued from page 284)

tion of the plant facilities required for the winter heating load. The balance of this plant capacity, on which the fixed charges have already been properly met by the load demanding it, should place the gas company in a position to enter new fields on the basis of special low rates for uses which will require large quantities of gas in the warmer months. While such rates are in general subject to review by public utility commissions, there is little reason to question their approval in view of the present practice of granting such rates for electric service during off-peak periods. Such a load is found in the heat required for the hot water supply of office buildings, department stores and apartment houses, in which the main heating plant should be shut down completely during the summer months. Similarly, a seasonal industry such as the burning of brick may be considered a potential customer of the gas company, when all the factors bearing on the over-all cost of fuel are considered.

Space cooling has been frequently suggested as another load which might profitably take up part of this summer plant capacity. In the refrigeration field, the advantage of gas as a source of energy is found in the simplicity of equipment and the consequent reduction of attendance and maintenance expense, rather than in the efficiency of the energy conversion. Thus the present extension of space cooling in the large installations required for theaters and other public buildings holds little of interest to the gas company, which must look for any sizeable load of this nature to a large number of small domestic installations. While the better insulated house now being fostered by gas heating advances the case for summer space cooling, it is obvious that it will be some time before this service will be a factor of importance in the business of the gas company.



BONDS TO FIT THE INVESTOR

Gas, A Century-Old Utility
Stronger today than ever before

HALSEY, STUART & CO.

THE gas business has not suffered from electric competition. On the contrary, both domestic and industrial consumption of gas is increasing—in the years of a great drought gas has been sold at four times the normal price. Natural gas consumption in the same period increased from about 100 billion to more than 1,000 billion cubic feet. A wide field for gas has developed in industrial heating. It is subject to perfect control, saves space and simplifies heating operations. In homes, general heating units are being installed at the rate of 100,000 annually. Gas for domestic and commercial refrigeration has a promising future. As a most economical and efficient fuel for heating, cooking and power, in the form of its principal derivatives, gas and oil.

Natural and manufactured gas companies, in good territories, are secured investment and their natural distribution in the public utility field. The business in each locality is generally recognized as a natural monopoly, thus avoiding destructive competition; it is practically an established industry and a legally established right to secure a fair return upon capital invested, under public regulation. One half of "The Strength of the Utilities" deals with this subject more completely. Write the booklet 125-37.

HALSEY, STUART & CO.

NEW YORK	CHICAGO	PHILADELPHIA	ST. LOUIS
BOSTON	DETROIT	PITTSBURGH	SPRINGFIELD
CINCINNATI	CLEVELAND	KANSAS CITY	MINNEAPOLIS
INDIANAPOLIS	MEMPHIS	MILWAUKEE	PORTLAND
SACRAMENTO	SAN FRANCISCO	SAN JOSE	SEATTLE
SIOUX FALLS	WICHITA	WYOMING	

Modern advertising calls attention to the modernness of the gas industry

INDUSTRIAL GAS SECTION

H. O. LOEBELL, Chairman

C. W. BERGHORN, Secretary

F. C. MACKEY, Vice-Chairman

Gas Must Be Sold to Industry

Reasons Why the Industrial Gas Engineer Has to Be More Than an Ordinary Order Taker

By W. F. MILLER

Industrial Gas Engineer, Public Service Company of Northern Illinois

A SURVEY of manufacturing equipment utilizing heat processes indicates that while the average industrial gas engineer may recognize the inherent weaknesses of the usual application of competing fuels, he fails to utilize this knowledge in the design of gas-fired equipment.

He is prone to accept a standardized gas furnace for universal application on problems included in the general classification covered by the manufacturer's literature. This application may or may not fit the requirements of the customer's needs. It may not utilize the superior inherent qualities of the fuel he sells or the method of heat application may not yield maximum performance for the particular job to which it is applied.

Industrial gas equipment manufacturers are meeting the issue by designing efficient gas-fired equipment which utilizes all the inherent advantages of gas fuel. It is obvious that in order to make a fair profit, the furnace manufacturer must more or less standardize the equipment he manufactures. Consequently, in the solution of a special application where competition from solid and liquid fuels is high, he must adopt one of the two following procedures: 1. Adapt a standard furnace to a special application. 2. Design a special furnace to fit a special problem.

The first method presents difficulties which are sometimes insurmountable, or leads to sacrifice of efficiency. The second method entails a large expense in en-

gineering, designing, experimenting, expensive materials, and so forth.

The Public Service Company of Northern Illinois found that 65 per cent of its industrial gas problems required special applications, while only 35 per cent could be handled by standard applications. If we have had our share of success in the industrial gas field, it has been due largely to the unique special applications we have been able to install to fit each customer's particular requirements.

In the design of this special equipment, we have been fortunate in having the co-operation of representative equipment manufacturers. Very often these firms have prepared designs at great expense and have willingly risked their profit on our ability to make the sale to our customer. The possibilities of obtaining other orders for these especially designed furnaces is oft times restricted, due to the limited field for the application. Much of their effort has been missionary work for the good of the industry. Many times their loyalty has cost them real money and I feel the industry should show proper appreciation for this valuable assistance. A fair price for a special furnace may sometimes be high from the customer's standpoint, but it does not seem proper that the equipment manufacturer should be compelled to shoulder the entire financial burden where the field for the particular application is restricted.

It is good policy to consider every heating process as a potential gas product. Very often an apparently high gas

Presented at the Illinois Gas Ass'n meeting, Springfield, Ill.

full cost handicap can be overcome by more efficient heat application.

While methods of heat application are fairly standardized for some of these processes, we must not lose sight of the fact that in the final analysis the factors governing the type of fuel to be utilized are unit production fuel cost and quality of work delivered. If we are to compete with fuels having a lower basic cost, our gas-fired equipment must have a relatively higher overall efficiency both in application and quality of product. In other words, competition will force gas companies toward special designs of furnaces which are capable of producing better quality of work at a higher overall efficiency than can be obtained by application of competing fuels.

Healthy competition is good for any industry. Remove the incentive for development and the industry languishes. Competing lower priced fuels are burned in a crude stage because of lack of incentive. The furnace manufacturer must make all his profit and overhead from equipment sale and he can afford to spend only a sufficient amount of energy and money in development work to meet competition from rival concerns. The sale of equipment is incidental to the merchandizing of a fuel, and the gas industry can afford to spend a greater amount of time and money in development of furnaces to create a market for gas.

When an industrial gas engineer becomes discouraged at times by basic fuel cost competition, he should figure that if gas sold itself, he would degenerate into an order taker, and that his position could probably be filled by a baking powder salesman.

It is apparent that the greatest field for development of the gas industry lies in sales for industrial purposes. Companies which have the foresight to adopt a rate enabling their customers to use gas in quantity should make a careful survey of all industries, both large and small, within their territory and study the heat application possibilities in each plant.

Such a survey should be a guide to new business endeavors on the part of the industrial gas department.

The next step is to convince the manufacturer that the advantages of scientific heat application with gas will offset its possibly higher cost. In a surprisingly large number of cases business may be secured if the proper effort is made, and each successful installation helps to make a succeeding sale.

In approaching an executive of a concern, try to know enough of his production problems to discuss them intelligently. Accurate knowledge of these problems can only be obtained by intimate contact with them. Learn to cultivate the personnel of the organization, particularly in production departments. Be tolerant of individual ideas even though they be contrary to your own. Different viewpoints often open up a new method of attack on the problem. Concentrate your direct sales effort on the executive but also remember that the plant personnel must be equally sold, if you are to maintain a successful installation.

A preliminary basis for discussion of competing fuel costs, sometimes necessitates an analysis of production cost accounts of the concern. The size of a firm is no indication of the accuracy of its system of cost accounting. In examining these accounts, try to determine if all items properly chargeable to the process are so distributed. Be fair in this analysis and reach a basis of agreement equitable to the interests of both the customer and yourself. Do not stress intangible value too strongly. Certain legitimate charges for maintenance, interest on the investment, labor saving, depreciation, floor space occupied, etc., are recognized, but as a rule it is hard to capitalize cleanliness, comfort of operators, and readiness to serve.

It may become necessary to run a test on equipment under actual operating conditions to determine unit production fuel cost with the fuel being used. It goes without saying that such test should

be impartial and honest. This is good business sense, since a customer sold by misrepresentation will not remain a satisfied customer. Earn a reputation for square dealing and the customer will learn to respect your judgment.

In the selection of equipment to fit the particular application, carefully consider propositions submitted by reputable manufacturers. Pay for advice from consulting engineers if the character of the application requires such assistance. In any event, make the manufacturer sell you, not with sales propaganda but with basic engineering facts. Let him make a guarantee of performance if necessary but do not insist on a fuel consumption guarantee.

After making the equipment selection, present the proposition to the customer, giving it your personal indorsement. Do not confuse his decision by offering alternate propositions. There is one best solution to every problem. Find it, stick to it, and do not accept a compromise unless the equipment investment is too high for the customer's pocketbook.

An industrial gas engineer's duty does not stop with the installation of the equipment. He should keep in constant touch with the customer and render intelligent service when required. Give the customer the benefit of your experience in straight line production methods and do not be timid with suggestions for saving gas on existing installations.

The writer is proud to be identified with a company which has never hesitated to sacrifice immediate industrial gas revenue, if by so doing, it could better serve the interests of the customer. A satisfied gas customer today may have his satisfaction jolted tomorrow by a more efficient heat application with a cheaper fuel. In our territory, we have repeatedly replaced existing gas-fired installations with more efficient gas applications, of our own free will, and have lost some immediate gas revenue by so doing.

This is not philanthropy, this common horse sense and loss of immediate gas

revenue has been more than balanced by the consequent broadening of the field for gas applications. Make the customer realize that his interests and your own are identical, and that you are out to make his installation permanent, even if you lose gas revenue by so doing.

Finally, be personally sold to the product you sell. You can convince a shrewd customer of your sincerity only when you do not reserve a mental apology for the commodity for sale. Also, remember that persistent, consistent, and insistent sales effort must be rewarded by a due measure of success.

M. I. T. Industrial Gas

Course Opens June 13th

ON June 13, 1927, the sixth annual course for industrial gas men will open at the Massachusetts Institute of Technology.

Starting in 1923, under the able direction of such men as C. E. Paige, C. L. Pritchard, F. E. Drake, and J. P. Ingle, who were members of the New England Guild of Gas Managers, a two weeks' course has been conducted each year at the Massachusetts Institute of Technology for the benefit of men in the industrial divisions of the New England Gas Companies. These courses have consisted of lectures by members of the teaching staff of the Massachusetts Institute of Technology, lectures from specialists in the industrial field of the gas industry, and practical laboratory work in the gas laboratory of the Institute. It was the aim of this course to assist the men of the New England companies who were selling industrial gas.

In 1926, the American Gas Association, through the chairman of the Educational Committee, took an active interest in the course and at the conclusion of the course for industrial gas salesmen held in New York City by the A. G. A. last fall, it was tentatively decided that the New York courses in the future would tend to the sales end of the industrial gas, while courses run at the Massachusetts Institute of Technology and possibly at some point in the Middle West and another in the South, would care for the technical side of the subject. With this in view, the Educational Committee of the New England Gas Association has drawn up a program which has been approved by the Educational Committee of the American Gas Association.

This program will consist of a rapid review of the subject of combustion, using the Amer-

ican Gas Association Industrial Gas Series Handbook on the subject as a text. This work with its attendant problems and discussions, under the direction of Prof. Gordon B. Wilkes, will occupy seven periods during the first week. Additional lectures will be given on the subject of heat treatment, by Prof. Robert S. Williams; report writing, by Prof. Winnard Prescott; low temperature ovens and their control, by M. B. Webber, engineer and assistant treasurer of the Athol Gas and Electric Company; furnace design by Joseph Jares, of the Brooklyn Union Gas Company. There will be additional lectures on heat transfer, refractories, combustion systems, and a final lecture on Friday, June 24th, on gas refrigeration, by H. D. Valentine of the Central Hudson Gas & Electric Company.

It is urged that the men who attend this course make reservations through Robert L. Gifford, secretary of the Educational Committee, N. E. G. A., c/o Pawtucket Gas Light Company, Pawtucket, R. I., as soon as possible.

Arrangements can be made through the secretary for most desirable housing in the Craft's Dormitory at the Institution. The section available faces on the beautiful Charles River Parkway. The charge will be twenty dollars per man for the two weeks. It has been stated by many of those who lived at the dormitory last year that the benefits they received from the association and exchange of ideas were incalculable. Reservations should be made by May 30th.

The tuition fee for the course is \$50 and it is anticipated that there will be a large attendance from all the Atlantic Coast States.

Gas to Lead Again at Steel Treaters' Show

Plans Being Made to Put an Even Better Exhibition Than the Record-Breaking One at Chicago in 1926



D. W. Chapman

similar gas exhibition at the annual meeting of the Society this September at Detroit, Mich., has met with favor.

The committee of the Industrial Gas Section having charge of this exhibit consists of the following members: Chairman, D. W. Chapman, The Peoples Gas Light and Coke Co., Chicago, Ill.; vice-chairman, A. M. Apman, Consolidated Gas Co. of New York, N. Y.; Hale Clark, The Detroit City Gas Co., Detroit, Mich., and R. G. Guthrie, The Peoples Gas Light and Coke Co., Chicago, Ill. The Committee has secured a section of the exhibition hall in a most desirable location. Approximately 15,000 sq.ft. of space will be used to bring the advantages

BECAUSE of the splendid results realized from the exhibition of gas-fired industrial appliances at the 1926 meeting of the American Society for Steel Treating at Chicago, Ill., the decision of the American Gas Association to support a

of gas to the attention of the members of the Steel Treaters' Society.

The fact that no stock equipment will be shown and that the important gas exhibits must be built on the location as well as the fact that the entire exhibit will be a working one, capable of heat treatment on a production tonnage basis, makes it necessary to allow approximately five weeks for the building, drying out, and trying of certain appliances, in addition to arranging for quenching facilities, training of personnel, etc. In reality it is necessary to build within a short time a complete production heat treating plant, with almost every type of furnace.

The exhibit held at Chicago last year was laid out along these lines. It was capable of handling all the heat treating requirements of a plant the size of the West Pullman Works of the International Harvester Company.

The Committee is busy lining up manufacturers of industrial gas-fired equipment, and is making every effort to have the 1927 show of gas equipment surpass the record-breaking one of 1926, when 23 furnaces were in actual operation.

COMMERCIAL SECTION

J. J. BURNS, Chairman

G. M. KARSHNER, Vice-Chairman

J. W. WEST, Jr., Secretary

Program Announced for N. Y. Sales Conference

**Three-Day Meeting to Be Held at Lake Mohonk, N. Y.,
Starting on May 26th**

THE fourth annual New York Regional Sales Conference will be held at Lake Mohonk, N. Y., May 26, 27, and 28. The success of the conferences in the past has led to an insistent demand for their continuation, and the feeling is prevalent among the commercial men of the New York territory that the conferences are of the greatest value in helping them formulate their commercial plans for the coming year.

The New York Regional Gas Sales Council, of which G. M. Karshner of the Consolidated Gas Company of New York, N. Y., is chairman, has decided that in addition to papers giving specific discussion of definite sales methods, a number of papers of a general sales nature should be included in the program. The list of subjects to be covered has been carefully prepared, and those selected to speak have been chosen from various sections and lines of business in order that territorial representation be secured while at the same time guaranteeing the quality of the material.

The round table discussions will be a feature this year, and all present will be asked to bring up pertinent questions for general discussion.

The same arrangements as to registration fees, hotel rates, and payments will obtain as were employed last year.

Lake Mohonk offers splendid opportunities for entertainment and the Entertainment Committee, consisting of E. R. Acker and K. C. Ogden, has arranged a unique order for the days of the conference.

The program for the Lake Mohonk Conference is as follows:

THURSDAY, MAY 26, 1927**10:00 A.M.**

Presiding: G. M. Karshner, Chairman
J. J. Burns

Opening Remarks—G. M. Karshner, Chairman, Consolidated Gas Company of N. Y., New York, N. Y.

Address of Welcome—T. R. Beal, Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y.

A Message from the A. G. A.—Alexander Forward, Managing Director, American Gas Association, New York, N. Y.

Today's Commercial Opportunities in the Gas Business—R. M. Searle, Rochester Gas & Elec. Corp., Rochester, N. Y.

Wholesaling Blue Star Homes—J. E. Davies, Peoples Gas Light & Coke Company, Chicago, Ill.

Achieving a New Record in Water Heating—B. H. Gardner, Northern Indiana Gas & Electric Co., Hammond, Ind.

Large Volume Water Heating—Anthony J. Peters, Consolidated Gas Company of N. Y., New York, N. Y.

Increasing the Load by Effective Salesmen's Compensation—E. R. Acker, Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y.

Methods of Training Domestic Salesmen—A. W. Humm, Standard Gas Equipment Corp., New York, N. Y.

FRIDAY, MAY 27, 1927**10:00 A.M.**

Presiding: J. J. Burns

Selling Gas in a Growing Territory—Andrew J. Gonnoud, Kings County Lighting Co., Brooklyn, N. Y.

Is the Oven Heat Control a Load Builder?—J. L. Farrell, Public Service Company of N. J., Passaic, N. J.

Home Service—The Good It Does the Gas Company—Mrs. Marjorie P. Wardman, Brooklyn Borough Gas Company, Coney Island, N. Y.

Selling Gas Through Employee Cooperation—J. J. Burns, The Laclede Gas Light Co., St. Louis, Mo.

Importance of Local Market Survey—Prof. G. B. Hotchkiss, N. Y. University.

What's Ahead in Domestic Cooking—A. W. Baker, Kansas City Gas Co., Kansas City, Mo.

Problems in Selling Gas Refrigeration—N. T. Sellman, Consolidated Gas Company of N. Y., New York, N. Y.

SATURDAY, MAY 28, 1927

10:00 A.M.

Presiding: E. R. Acker

Selling Gas in the Fireplace—F. D. Tansey, Brooklyn Union Gas Co., Brooklyn, N. Y.

Building the Incineration Load—H. D. Valentine, Central Hudson Gas & Elec. Corp., Poughkeepsie, N. Y.

Marketing Gas in the Home Laundry—A. M. Evans, Federal Electric Co., Chicago, Ill.

Selling Gas for House Heating—G. I. Vincent, Syracuse Lighting Co., Syracuse, N. Y.

The Measure of a Man—Robert Wall, United Thrift Plan, N. Y.

Problem is Fourfold

(Continued from page 290)

come to the office. Turn-on will be made at once in an emergency, but preferably within 24 hours. A new business representative will call at his house the following day with proper contract to be signed and make arrangements either for a cash deposit or proper credit. We are getting away from the old guarantor signature as far as possible and utilizing our credit department in the same way as the merchant on the street.

Handling Complaints — Complaints

made personally at the office are handled by one man and are comparatively simple to settle. We find that most complaints come in over the phone. Naturally the customer does not know what department he desires, and unless care is exercised he is passed from department to department until his patience is exhausted. All our phone complaints are referred to one department and to one man as much as possible. He does not refer the customer to other departments, but takes his phone number, checks up the complaint, and, calling the customer again, gives him the information desired.

Branch Office—For the greater convenience of our customers, we have opened a branch office in Kansas City which is much more accessible to certain sections of the city than our main office. Here customers may apply for service, pay bills, file complaints, or purchase merchandise. Incidentally, it is the headquarters of a number of the domestic sales units of the New Business Department, thereby giving them closer contact with their territory and saving them the time generally spent in going to and from the main office.

This is one of the most important selling activities of the modern natural gas utility.

Its advantages are known. I will only say that we are holding each year two campaigns of ten days each and that in one group of natural gas distribution companies serving over 200,000 customers during the last sale approximately 1500 employees made 45,000 calls upon customers and made over 4000 sales, totaling over 16,000 shares. The education of the employee, and through the employee of the customer, in what the company is and what it stands for, is invaluable in connection with these campaigns.

What all these activities amount to is expressed in three words "Selling the Company." If you have succeeded in this then you have earned that good will which is so essential to the success of your company as a public utility.

Section Plans Statistical Interpretation

New Committee of Commercial Section Will Investigate Value of Merchandising Figures

REALIZING the need for better use of commercial statistics, the Commercial Section of the American Gas Association has formed a new committee on the interpretation of Commercial Statistics. This committee will interpret all figures available in the industry at present, and will also promote among gas companies a greater use of statistics that are of a commercial nature.

Under the first part of the work will come the information collected by the General Federation of Women's Clubs. This comprises data on the number of gas ranges, water heaters, electric ranges, electric appliances, radios, automobiles, telephones, victrolas, and sanitary plumbing equipment in eight million homes located in 48 states and the District of Columbia. These data have already been summarized for the entire country and classified according to states and communities. The Committee will carry this further and endeavor to draw conclusions of national significance, while at the same time recommending the best method of utilizing the state and local data.

The article on page 281 gives the results of this work.

The committee also plans to analyze and utilize the data derived about a year ago from a market research of a selected list of 12 companies. These data cover sales of gas and appliances per customer over a period of years, expressed in units and dollars. Merchandising practices, load factor and other pertinent commercial information are also included in these data.

The committee feels that it is extremely important for companies to classify their sales of gas properly in order to make possible the use of correct rate structure and to secure additional business. The

classification used should recognize differences in volume and load factor characteristics of various classes of business and the differences in the class of market under consideration.

The committee also plans to devote considerable study to the best form of sales report. Several companies are known to be preparing systems in which the sales of appliances are valued in accordance with their estimated consumption over a limited number of years.

The committee has gone on record as strongly urging local companies to make a survey of number and type of appliances connected to their lines and the year's work will include recommended methods for making local surveys and suggestions as to how to interpret the information collected and utilize it in sales activities.

The members of the Committee on the Interpretation of Commercial Statistics are as follows: D. M. DeBard, Chairman, Stone & Webster, Inc., Boston, Mass.; D. T. Boyd, Henry L. Doherty & Co., New York, N. Y.; Prof. Phillip Cabot, Harvard University, Cambridge, Mass.; C. D. Lawrence, Central Hudson Gas & Electric Corp., Poughkeepsie, N. Y.; Prof. J. G. Coolidge, Harvard University, Cambridge, Mass.; Wm. M. Gould, Gas & Electric Improvement Co., Boston, Mass.

N. E. Sales Conference

To Be Held June 3-4

THE third New England Sales Conference will be held at the Hotel Mohican, New London, Conn., June 3-4. The first session will start at 2 P.M., June 3. A dinner and evening session will follow, and the closing session will be held the morning of June 4.

The committee in charge has arranged a varied and practical program.

Progress in Exact Analysis of Flue Gas

(Continued from page 280)

erated is recorded by a recording potentiometer. Before the gas reaches the hopcalite, it must pass through the following system: A small pump, motor driven, to draw the gas from the appliance and force it through the system; two bottles partly filled with sulfuric acid to dry the sample; a bottle filled with glass wool to filter solid particles and acid spray; a canister containing granular activated charcoal, soda lime and absorbent cotton to take out some of the hydrocarbon vapors; a water well to adjust the rate of gas flow; an orifice type of flowmeter with water-filled manometer to indicate flow; reservoir of water draining into the water well to keep constant temperature and pressure on the gas; receptacle containing calcium chloride to further dry the gas; a steam bath surrounding copper coils and the hopcalite cell; the steam bath heated by a gas flame, and having a reflex condenser to keep steam from escaping. This steam serves two purposes, namely: (a) to heat the products of combustion to 212 degrees F., so that they enter the hopcalite at a constant temperature; (b) to heat the catalyst to 212 degrees F., which is considered the best temperature for the reaction to take place.

CARBON DIOXIDE APPARATUS

For determining the air-free factor to convert the per cent carbon monoxide as sampled to an air-free basis two methods are possible, analyzing for the oxygen present in the sample or for the carbon dioxide present. Since the analysis for oxygen necessitates determining the carbon dioxide and the analysis for oxygen is a slow one and not very accurate, it was decided to use the second possibility, that of determining the carbon dioxide. It was found that both methods gave check results. Accordingly the time for analysis was shortened and the accuracy

increased because the analysis for carbon dioxide is more accurate than the one for oxygen.

The difference between the carbon dioxide apparatus and the orsat is in the burette, 10 c.c. of the burette being graduated to 0.01 c.c. and 90 c.c. ungraduated, and in the compensating tube for pressure adjustment. Water or mercury may be used as the confining liquid. It is possible with this apparatus to get an accuracy of 0.02 or 0.03 of one per cent.

It is necessary to know the analysis of the gas being burned from which the combustion and the volume of dry products of combustion is calculated. Dividing the volume of carbon dioxide formed by the volume of dry products gives the per cent carbon dioxide air-free. To obtain the air-free factor, divide the per cent carbon dioxide air-free by the per cent carbon dioxide found in the sample of the products of combustion from the appliance being tested.

Good progress has been made in the last few years in the exact analysis of flue gas. The analysis for carbon dioxide and carbon monoxide is very satisfactory although there is need for a carbon dioxide recorder or indicator accurate to 0.01 of one per cent and an indicating carbon monoxide apparatus which would operate on a much smaller volume of sample than the recorder. From a scientific standpoint it would be interesting to have instruments capable of analyzing for low percentages of hydrogen and aldehydes. It would be interesting to know what the ratio of carbon monoxide to hydrogen is in the products of incomplete combustion from gas appliances, and instead of relying on the nose to detect aldehydes, to be able to analyze for the amount present.

With the increased interest being shown by gas appliance manufacturers and the gas industry as a whole in the manufacture and sale of Blue Star appliances, strides in the exact analysis of flue gas may be expected to be as rapid in the future as they have been in the past.

TECHNICAL SECTION

WALTER C. BECKJORD, Chairman

HARRY E. BATES, Vice-Chairman

H. W. HARTMAN, Secretary

Successful Distribution Conference Is Held

Meeting at Baltimore, Md., on April 4 and 5, Attracted
More Than 250; Important Subjects Discussed

MORE than 250 interested gas men attended the fourth annual distribution conference at Baltimore, Md., April 4 and 5. The value and popularity of these conferences, already proved by those held in past years, was enhanced this year by the atmosphere prevailing, one that prompted the freest kind of discussion of salient points raised. C. C. Simpson, of the Consolidated Gas Company of New York, and chairman of the Distribution Committee, and H. W. Hartman, secretary of the Technical Section, had charge of the arrangements, etc.

Prominent on the program were a number of progress reports on important distribution matters. The complete reports of these subjects will be presented at the meetings of the Technical Section at the Chicago convention in October, but the progress reports were of great value to those attending the conference.

The "Economics of Long Distance High Pressure Transmission" was presented by F. A. Lydecker, of the Public Service Electric and Gas Co., Newark, N. J. Mr. Lydecker had prepared some interesting charts which showed the differential costs between small and large plants, the cost of pumping and capital investment for electric and steam drives, the amount of steam and power required per unit of gas, the steam consumption per horse power, cost of pumping various quantities of gas at different pressures, etc. He considered the costs of transmitting gas in various sized mains up to 42" for distances up to 250 miles.

J. D. von Maur, of the Consumers Gas Company, of Toronto, Canada, presented a paper on "Pipe Joints," in which he

brought out the necessity for proper workmanship and supervision for the success of joints regardless of the type used. He considered the subject both from the standpoint of safety as well as gas leakage. A questionnaire which had been sent out showed that there is no marked unanimity of opinion as to the relative value and proper uses of the prevailing types of joints. Mr. von Maur outlined in considerable detail the method of procedure to use when making various types of joints.

"Pipe Coatings," by J. K. Crowell, of the Westchester Lighting Company, Yonkers, N. Y., was an interesting paper on the characteristics of these materials. Forty-five companies had answered to a questionnaire sent out. The results were as follows: Twenty-three use pipe coatings as a regular practice, none protect cast iron pipe, ten use wrapping, and four use galvanized pipe. After listing the properties, etc., of all the pipe coatings now available, Mr. Crowell said that the selection of a coating resolves itself to an economic problem depending on various local conditions.

H. K. Logan, of the Bureau of Standards, reported on the soil corrosion investigation that has been conducted by the Bureau. There is a wide variation in the rate of corrosion of different pipes in different soils, according to the report, and as yet no pipe has been found that is the best suited for all kinds of soils. In the discussion it was suggested that the American Gas Association unite with the American Petroleum Institute and the Bureau of Standards in a complete in-

vestigation of the extent of corrosion and the methods of preventing it.

O. S. Hagerman, assistant engineer, American Light and Traction Company, New York, N. Y., presented a very interesting paper on "Supplying Concentrated Areas in Outlying Districts." This was in the nature of a progress report, and among the points brought out was that high pressure systems in various situations will cost about 60 per cent of the low pressure. The quality of high pressure will be equal to or surpass that obtained with low pressure when a good degree of dehydration is obtained. High pressure is the most economical means of supplying these outlying districts when there are favorable soil conditions and a dehydrated gas.

The necessity of knowing the life of steel pipe in the soil before any conclusions regarding the costs of high pressure and low pressure are made was brought out in the discussion. The fact that the density of population has a great deal to do with the advisability of using low or high pressure was also brought out. Up to 135 customers to a mile of high pressure main seems to be the most economical, according to some present.

E. S. Umstead, of the Providence Gas Co., Providence, R. I., distributed copies of "Pipe Materials," which contained answers received from a questionnaire. There was a wealth of valuable information contained therein.

An interesting talk on the importance of distribution work to the gas company was given by Alexander Forward, managing director of the American Gas Association. Since nearly 60 per cent of the gas industry's total investment is in the distribution system, and since there is such a tremendous expansion of the industry at present, the work of the distribution men will be of the greatest importance. In Major Forward's opinion, the distribution problems of today necessitate the highest degree of technical ingenuity and engineering knowledge.

M. I. Mix, of The Peoples Gas Light

and Coke Co., Chicago, Ill., stated that the house heating problem must be worked out on general principles so that local problems can be solved better. After discussing various types of systems, the point was brought out that since the maximum hour usually comes at a different time than the maximum demand due to house heating, an increase in house heating business may often be taken care of without added distribution investment. Chicago now has 1600 central gas heating plants and a maximum hour of 13.5 million cu.ft. If this maximum hour were doubled, they could have 32,000 house heating installations. This means that if Chicago should double their total output, the increase being due to house heating, they would only double their maximum hour and have as good a load factor as before.

The Chicago conditions were studied to determine which method of increasing the capacity of the distribution system would prove the most economical.

The paper on "New Developments on Power Machinery for Distribution Work," by F. M. Goodwin, vice-president, Boston Consolidated Gas Company, was a summary of the results of a questionnaire sent out on this subject. Out of 54 companies reporting it was found that all used digging machinery with the exception of three. Of the companies reporting the use of compressors, 29 mounted them on trucks and ten on trailers. Fifteen companies reported the use of tractors and all but 12 the use of backfillers.

With the aid of a series of charts comparing meter performances of various companies, Geo. A. Lane, The Peoples Gas Light & Coke Company, Chicago, Ill., gave an instructive paper on "Meters—Industrial and Domestic." Meter removals were analyzed and the importance of meter location, care in the installation of proper capacities, repairs, etc., discussed.

At the Open Forum on the afternoon of the last day of the conference a great

many subjects of vital interest were discussed. The use of the self-lubricated cock in place of valves for a number of applications was favorably commented on. The general experience was that there was less leakage in a high pressure system than in a low pressure one, but, it was thought that actual comparisons are difficult to make as leakage on a low pressure system is largely in the services and high pressure systems tend to be newer and therefore hardly comparable with old low pressure situations. The use of leak clamps with bell and spigot joints was considered.

It was the opinion of all gathered at the conference that the subjects presented and discussed were of paramount importance, and that the annual distribution conference has become one of the most successful activities of the A. G. A.

Southwestern Gas Meter

Short Course Successful

NEARLY 300 attended the Southwestern Gas Meter Short Course conducted by the College of Engineering of the University of Oklahoma assisted by the Corporation Commission of Oklahoma and the Oklahoma Utilities Association. The Course was held at the University, Norman, Oklahoma, April 5, 6, and 7, 1927. This group representing ten states spent the entire three days in a conscientious application in the interest of better accuracy of gas measurement. The program was a full one, treating all phases of the design, construction, maintenance and repair of gas measuring appliances and provers. The mornings were spent in the lecture room while, in the afternoons the group was divided for shop work practice on all classes of equipment. The following are some of the exceptionally fine papers read: "Recent Experiments on Straightening Vanes and Pipe Line Flow Formulae" by E. L. Rawlins of the U. S. Bureau of Mines; "Regulating Pressures and Measuring Natural Gas" by A. J. Kerr of the Equitable Meter and Mfg. Co.; "Problems of Wet Gas Measurement" by a representative of the National Gasoline Mfgs. Association; "The Relation of Specific Gravity to Measurement"; "Cleaning Natural Gas" by H. B. Milan of the Empire Companies; "New Developments in the Design of the Orifice Meter" by C. E. Mason of the Foxboro Company; "Public Re-

lations" by R. E. McBeth of the Oklahoma Natural Gas Corporation, and "Large Volume Gas Measurement at High and Low Pressures" by John Diehl of the Metric Metal Works. During the sessions Dr. William Bennett Bizzell, President, and J. H. Felgar, Dean of the College of Engineering, of the University of Oklahoma, addressed the gathering.

Omission

DUE to an error, the name of Mears, Kane-Ofeldt, Inc., was not included under "Industrial Gas-Fired Boilers," on page 11 of the April issue of the Classified Directory.

U. of Michigan to Take

Part in Gas Research

RECEIPT of an appropriation of \$10,000 from the American Gas Association for a program of intensive research in the use of gas for steel treating at the University of Michigan was announced recently by Prof. A. E. White, head of the department of engineering research at the University.

A specialist in metallurgy and a staff of laboratory assistants will immediately start a series of investigations into the uses of gas for heat treating of steel and in forging furnaces according to Prof. White. The work will be under his direction.

"This appropriation is taken from our special fund of \$500,000 to be used in a five-year program of research in the field of large scale industrial use of gas," Alexander Forward, managing director of the American Gas Association, says in commenting on the engineering research.

Factors considered by the gas association in selecting Michigan for this work are: Excellent facilities are available in the laboratories of the University for prosecution of this study; the University is almost in the center of the steel-treating industry—a large percentage of the work of this character in the United States being done in factories located within a radius of 50 miles of Detroit.

Prof. A. E. White is past-president of the American Society for Steel Treating, and for 20 years has devoted a major portion of his time to metallurgical problems. During the war he was head of the Metallurgical Department of the Inspection Division of the United States Army Ordnance Department. Prof. A. H. White has had contact with the Michigan Gas Association for more than 20 years, and has an intimate knowledge of the gas industry.

Two Hundred Slogans Submitted

(Continued from page 288)

Heat by pipe line
The answer to the fuel problem, use gas
For heating, use gas, the concentrated fuel
For heating, use gas, the 100% heat producer
For heating efficiency and economy, use gas
Use gas, nature's prepared fuel
Use gas, the always-ready fuel
Use gas, nature's heat producer
Use gas, the universal heat producer
Use gas, the world's heat producer
For all heating, use gas
Use gas, the adaptable fuel
For the good of mankind, use gas
For perfect combustion, use gas
Use gas, clean, efficient, cheap, uniform
Use gas, the universal heating aid
This is the age of gas, use it
To save fuel, use gas
Use gas, the fuel saver
Use gas, the spirit of coal
Use gas, the spirit of heat
Use gas, the great economizer
Use gas, the eliminator of fuel trouble
More gas, more heat
Gas for the world
For energy, efficiency and cleanliness in heating, use gas
Solve your fuel problems with gas
Use gas, the best heating fuel
If you want heat, use gas
Use gas, the essential of modern civilization
Use gas, the key of modern civilization
Use gas, the world's industrial lever
Use gas, the servant of industry and the home
Use gas, the staff of civilization
Use gas, it exists for service
Use gas, the modern alchemist

Use gas, the flame of industry and the home
Use gas, the master fuel
Gas "life out of death—new out of old"
Of course, use gas
Stop the smoke nuisance by using gas
For health's sake, use gas
Give us sunlight, use gas
Stop waste, use gas
Better products—better homes—with gas
Use gas and save coal
Increased Output } Use gas
Decreased Costs }
For happier homes, use gas
For all heating, use gas
Gas for heating
Gas for the world's heat
Get the gas habit
Use gas, the triumph of public service
Nothing can beat gas for heating

Testing Radiant Heaters

(Continued from page 275)

tested being usually about 1.4. Readings can be made within 0.02 millivolts, thus indicating a degree of accuracy within the limits of the usual efficiency test. From the above figures we find variations in intensity of radiant heat from zero to above 700 B.t.u. per sq.ft. per hour. It is evident that any calorimetric method attempting enough measurements to average this variation would be too tedious.

In conclusion, this method appears to be more rapid and at the same time, more reliable than any other yet tried.

Statement of the Ownership, Management, Circulation, Etc., Required by the Act of Congress of August 24, 1912

Of the American Gas Association Monthly published monthly at Brattleboro, Vermont, for Apr. 1, 1927.

State of New York, County of New York, ss.

Before me, a notary public in and for the state and county aforesaid, personally appeared Howard F. Weeks, who, having been duly sworn according to law, deposes and says that he is the Editor of the American Gas Association Monthly and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, American Gas Association, New York, N. Y.; Editor, Howard F. Weeks, New York, N. Y.; Managing Editor, None; Business Managers, None.

2. That the owner is: American Gas Association, 342 Madison Ave., New York City; President, Alexander B. Macbeth, 342 Madison Ave., New York, N. Y.; Vice-president, O. H. Fogg, 342 Madison Ave., New York, N. Y.; Treasurer, C. E. Paige, 342 Madison Ave., New York, N. Y.; Managing-Director, Alexander Forward, 342 Madison Ave., New York, N. Y.

3. That the known bondholders, mortgages, and other security holders owning or holding 1 per cent or more of

total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

HOWARD F. WEEKS.

Sworn to and subscribed before me this 29th day of March, 1927.

(Seal)

CHESTER H. DRAKE,

Notary Public, Queen's Co., No. 418.
(My commission expires March 30, 1928.)

Associations Affiliated with A. G. A.

K. R. Boyes, Secretary

Canadian Gas Association

Pres.—J. J. Armstrong, Consumers Gas Co., Toronto, Ont.
Sec.-Tr.—G. W. Allen, 7 Astley Avenue, Toronto.
Conv., Toronto, Ont., June 16 & 17, 1927.

Empire State Gas and Electric Association

Pres.—H. M. Brundage, Consolidated Gas Co. of New York, New York, N. Y.
Chairman Gas Section—J. E. Cooper, Utica Gas & Electric Co., Utica, N. Y.
Sec.—C. H. B. Chapin, Grand Central Terminal, New York, N. Y.
Conv., Lake Placid Club, Lake Placid, N. Y., Oct. 6 & 7, 1927.

Illinois Gas Association

Pres.—P. D. Warren, The Peoples Gas Light & Coke Co., Chicago, Ill.
Sec.-Tr.—R. V. Prather, 305 Illinois Mine Workers Bldg., Springfield, Ill.
Conv., 1928.

Indiana Public Utility Association—Gas Section

Pres.—E. Van Arsdal, 1100 J. F. Wild Bldg., Indianapolis, Ind.
Sec.-Tr.—E. J. Burke, Room 1270, Peoples Gas Bldg., Chicago, Ill.
Conv., French Lick Springs Hotel, French Lick, Ind., May 19, 20, 21, 1927.

Michigan Gas Association

Pres.—C. R. Henderson, Washtenaw Gas Co., Ann Arbor, Mich.
Sec.-Tr.—A. G. Schroeder, Grand Rapids Gas Light Co., Grand Rapids, Mich.
Conv., Grand Hotel, Mackinac Island, Mich., July 5, 6, 7, 1927.

Mid West Gas Association

Pres.—C. A. Nash, United Light & Power Co., Davenport, Iowa.
Sec.-Tr.—A. J. Schmidt, Des Moines Gas Co., Des Moines, Iowa.
Conv., 1928.

Missouri Association of Public Utilities

Pres.—F. S. Dewey, Kansas City Power and Light Co., Kansas City, Mo.
Sec.-Tr.—F. D. Beardslee, 315 N. 12th St., St. Louis, Mo.
Conv., Cape Girardeau, Mo., May 5, 6, 7, 1927.

New England Gas Association

Pres.—William Gould, Gas and Electric Improvement Co., Boston, Mass.
Secretary—E. A. Taylor, 100 Weybosset St., Providence, R. I.
Chairman Operating Div.—A. H. Scott, New Britain Gas Light Co., New Britain, Conn.
Secretary Operating Div.—F. E. Drake, Lynn Gas & Electric Co., Lynn, Mass.

Pres. Sales Div.—M. B. Webber, Marlboro-Hudson Gas Co., Boston, Mass.
Sec.-Tr.—Sales Div.—J. H. Sumner, 719 Massachusetts Ave., Cambridge, Mass.
Pres. Industrial Div.—R. J. Fhelen, Worcester Gas Light Co., Worcester, Mass.
Sec.-Tr. Industrial Div.—J. J. Winn, Jr., Fall River Gas Works Co., Fall River, Mass.
Conv., 1928.

New Jersey Gas Association

Pres.—J. L. Conover, Public Service Electric & Gas Co., Newark, N. J.
Sec.-Tr.—Louis Stoecker, Public Service Electric & Gas Co., Newark, N. J.
Conv., 1928.

Oklahoma Utilities Association

Pres.—E. R. Ernberger, Southwestern Light & Power Co., Oklahoma City, Okla.
Mgr.—E. F. McKay, Oklahoma City, Okla.
Conv., second week March, 1928.

Pacific Coast Gas Association

Pres.—W. S. Yard, Pacific Gas & Electric Co., San Francisco, Calif.
Exec. Sec.—Clifford Johnstone, 447 Sutter St., San Francisco, Calif.
Conv., Santa Cruz, Calif., Sept., 1927.

Pennsylvania Gas Association

Pres.—J. A. Weiser, Peoples Light Co., Pittston, Pa.
Sec.-Tr.—Geo. L. Cullen, Harrisburg Gas Co., Harrisburg, Pa.
Conv., 1928.

Southern Gas Association

Pres.—P. S. Arkwright, Georgia Power Co., Atlanta, Ga.
Sec.-Tr.—J. P. Connolly, 141 Meeting St., Charleston, S. C.
Conv., 1928.

Southwestern Public Service Association

Pres.—H. E. Borton, Mineral Wells Electric Co., Dallas, Texas.
Chairman Gas Section—C. K. Fletcher, Fort Worth Gas Co., Fort Worth, Texas.
Sec.—E. N. Willis, 403 Slaughter Bldg., Dallas, Texas.
Conv., 1928.

Wisconsin Utilities Association

Pres.—John St. John, Madison Gas & Electric Co., Madison, Wisc.
Exec.-Sec.—J. N. Cadby, 445 Washington Bldg., Madison, Wisc.
Conv., 1927.

Geographic Divisions

Eastern States Gas Conference

Pres.—H. H. Newman, Public Service Electric & Gas Co., Trenton, N. J.

Sec.-Tr.—J. C. Smith, Consumers Gas Co., Reading, Pa.
Conv., 1928.

Ninth Annual Convention of the American Gas Association

Chicago, Ill.

Stevens Hotel

Oct. 10-14, 1927

Employment Bureau

(Address All Communications to Key Number)

SERVICES REQUIRED

WANTED by large gas company in middle west, salesman for industrial gas appliances. Address A. G. A. Key No. 073.

SALESMEN—Large Public Utility Company operating in Central New York and many other states, desires to employ several securities salesmen to sell company securities. Excellent opportunity. State salary, age, experience, married or single. Address A. G. A. Key No. 080.

INDUSTRIAL GAS SALES REPRESENTATIVE: Gas company in a Middle Atlantic State has an opening for a technical college graduate, with fundamental knowledge of application and combustion of various fuels, to sell gas for industrial uses. Must be capable of making plant surveys of heat applications. State age, education, experience and salary desired. Address A. G. A. Key No. 085.

SALESMAN—Chiefly for gas-fired steam radiators, also other gas appliances to work in New York City. One acquainted with plumbing and heating trade preferred. Salary and commission basis. Address A. G. A. Key No. 094.

A PROGRESSIVE Gas Company in Mass. has an opening in its Industrial Gas Engineering Department for a Technical College Graduate to sell gas for industrial uses. State age, education, experience, and salary desired. A fine opportunity for the right young man. Address A. G. A. Key No. 095.

SHOP FOREMAN—Wanted by Company operating in the Metropolitan District of New York City, 25,000 Meters. Must be thoroughly familiar with all classes of work on consumers' premises, industrial appliances, routing and transportation. Give age, experience and compensation desired. References will be considered confidential if requested. Address A. G. A. Key No. 097.

INDUSTRIAL GAS ENGINEER wanted by large gas company operating in middle west. Write, giving age, experience, and qualifications. An opportunity for the right man. Address A. G. A. Key No. 0100.

WANTED—A **SALES ENGINEER** for the industrial use of gas. Must be an engineer with sufficient technical knowledge and experience with gas fuel to make the necessary calculations for the design or adaptation of furnaces to use gas as a fuel. Must also have the energy, persistence and tact necessary for this. Salary \$300.00 per month;

location, Virginia. Submit record and references with application. Arrangement will be made for personal interview with those whose records indicate suitability for this position. Address A. G. A. Key No. 0102.

MANAGER—Holding company desires a manager for one of its southern gas companies in city of about 15,000 population. Applicants please specify experience, training, present location, salary desired, and other facts in first letter. Address A. G. A. Key No. 0103.

SERVICES OFFERED

AGGRESSIVE COMMERCIAL MANAGER—34 years of age, available October or November. Thoroughly familiar, Industrial, Commercial and Domestic Sales Promotion. Address A. G. A. Key No. 220.

ACCOUNTANT and Office Manager with wide experience in management, purchasing and all office details. Address A. G. A. Key No. 223.

POSITION wanted as Superintendent of small gas company or as General Foreman of large plant. Approximately seventeen years' experience in all branches of manufacture and distribution, high and low pressure systems. Address A. G. A. Key No. 224.

A MAN 31 years of age and married seeks admission in the Gas or an affiliated industry on possession of the following qualifications. A knowledge of the fundamentals of Gas making. A quite thorough theoretical and practical knowledge of Combustion. A close acquaintance among the officials of a majority of the Central Stations of the East. A background of eight years' experience in Sales Management and Supervision in both the Wholesale and Retail Coal Business. One year's experience in the management of the Sales Distribution and Installation work of an Oil Burner. A natural leaning toward legitimate promotion and its accompanying contact work. Desirable references as to Character, Personality and Ability. Address A. G. A. Key No. 225.

POSITION as manager of small gas or combination gas and electric property or as commercial manager of a larger property by a man thoroughly reliable with wide experience and a record for producing results. Address A. G. A. Key No. 226.

CHEMICAL ENGINEER—with 7 years' experience in the testing and developing of different classes of gas appliances also familiar with the testing and utilization of natural gas and manufactured gas—A-1 references. Address A. G. A. Key No. 227.

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AMERICAN GAS ASSOCIATION, INC.

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